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## APPENDIX J.

NOTE.—Unless otherwise stated, all wave-lengths are upon Rowland's scale in air of about 20° C. and 760 mm. pressure. All oscillation frequencies are in vacuo.

### IRON (SPARK SPECTRUM).

Exner and Haschek: 'Sitzungsber. kais. Akad. Wissensch. Wien,' cvi. 1897.

The measurements of Kayser and Runge are in the *arc* spectrum.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo <i>cm<sup>-1</sup></i>
			$\lambda +$	$\frac{1}{\lambda}$	
(4736·96)	1	4736·96 Rowland	1·30	5·8	21104·8
4710·45	1	4710·37 K. & R.	1·29	„	21223·6
4707·50	1	4707·45 „	„	5·9	21236·8
4691·60	1	4691·52 „	1·28	„	21308·8
4679·02	1	4678·97 „	„	„	21366·1
4673·4	1n	4673·29 „	„	„	21392
4669·4	1n	4669·30 „	„	„	21410
4668·30	1	4668·23 „	„	„	21415·2
4667·62	1n	4667·56 „	„	„	21418·3
4647·62	1	4647·54 „	1·27	„	21510·5
4638·20	1	4638·13 „	„	„	21554·2
4637·70	1	4637·66 „	„	„	21556·5
4635·50	1n	„	„	„	21566·7
4633·06	1	4633·02 „	„	6·0	21578·0
4629·51	1	4629·44 „	„	„	21594·6
4625·22	1	4625·19 „	„	„	21614·6
4619·45	1	4619·40 „	„	„	21641·6
4613·45	1n	4613·35 „	1·26	„	21669·8
4611·45	1	4611·38 „ 11·437 R.	„	„	21679·2
4607·73	1	4607·79 „	„	„	21696·7
4603·11	2	4603·03 „	„	„	21718·4
4598·31	1	4598·26 „	„	„	21741·1
4595·56	1	4595·48 „	„	„	21754·1
4592·83	1	4592·75 „	„	„	21767·1
4584·01	4	4583·93 „	„	„	21809·0
4576·48	1	„	1·25	„	21844·9
4556·25	1	4556·22 „	„	6·1	21941·8
4556·04	1	„	„	„	21942·8
4554·20	1 Ba	4554·16 „	„	„	21951·7
4552·72	1n	4552·66 „	„	„	21958·8
4549·65	3	4549·57 „	„	„	21973·6
4548·00	2	4547·95 „	„	„	21981·6
4541·68	1	4541·43 „	1·24	„	22012·2
4531·32	2	4531·25 „	„	„	22062·5
4529·80	1n	4529·75 „	„	„	22069·9
(4528·80)	6	4528·78 „ 28·80 R.	„	„	22074·8
4525·31	2	4525·27 „	„	„	22091·8

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4522·80	2	4522·72 K. & R.	1·24	6·1	22104·1
4520·41	1	4520·35 "	"	"	22115·8
4517·68	1	4517·64 "	"	"	22129·2
4515·49	1	4515·36 "	"	"	22139·9
4514·31	1	4514·29 "	"	"	22145·7
4508·42	2	4508·40 "	"	"	22174·8
4494·74	5	4494·67 " 94·725 R.	12·3	6·2	22242·0
4491·58	1	4491·53 "	"	"	22257·7
4490·93	1n	4490·88 "	"	"	22260·9
4490·24	1	4490·19 "	"	"	22264·3
4489·88	1	4489·84 "	"	"	22266·1
4489·34	1n	4489·08 "	"	"	22268·8
4488·3	1b	4488·26 "	"	"	22274
4485·82	1	4485·77 "	"	"	22286·3
4484·40	2	4484·36 "	"	"	22293·3
4482·94	1	4482·86 "	"	"	22300·6
4482·40*	4	4482·35 "	"	"	22303·3
4480·31	1	4480·26 "	"	"	22313·7
4479·76	1	4479·73 "	"	"	22316·4
4476·19	5	4476·20 "	"	"	22334·2
4469·54	2	4469·53 "	"	"	22367·5
4466·70	5	4466·70 "	1·22	"	22381·7
4464·91	1	4464·88 "	"	"	22390·7
4462·15	1n	4462·11 "	"	"	22404·5
4461·80	3	4461·75 "	"	"	22406·3
4459·28	4	4459·24 "	"	"	22418·9
4458·22	1n	4458·35 "	"	"	22424·3
4456·46	1	4456·46 "	"	"	22433·1
4454·89	1	"	"	"	22441·0
4454·53	2	4454·50 "	"	"	22442·9
4451·70	1n	4451·71 "	"	"	22457·1
4450·46	1	4450·44 "	"	"	22463·4
(4447·90)	3	4447·85 " 47·90 R.	"	"	22476·3
4443·35	3	4443·30 "	"	"	22499·3
4443·00	1	4442·97 "	"	"	22501·1
4442·51	4	4442·46 "	"	"	22503·6
4440·05	1	4439·96 "	"	"	22516·1
4438·50	1	4438·50 "	"	"	22523·9
4437·06	1	4437·04 "	"	"	22531·2
4435·31	1	4435·27 "	"	"	22540·1
4435·20	1	"	"	"	22540·7
4433·97	1	4433·98 "	"	"	22547·0
4433·39	2	4433·32 "	"	"	22549·9
4432·73	"	4432·68 "	"	"	22553·3
4430·79	2	4430·74 "	1·21	6·3	22563·0
4430·35	1	4430·32 "	"	"	22565·3
4427·49	3	4427·44 "	"	"	22579·9
4424·6	1b	4424·26 "	"	"	22595
4422·74	3	4422·67 "	"	"	22604·1
4419·93	1	"	"	"	22618·5
4419·70	1	"	"	"	22619·7
4415·98	1	"	"	"	22638·7
4415·29	8	4415·27 "	"	"	22642·3
4413·70	1	"	"	"	22650·4
4410·9	1b	"	"	"	22664·8



## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4409·44	1		1·21	6·3	22672·3
4409·34	1	4409·25 K. & R.	"	"	22672·8
4408·59	2	4408·54 "	"	"	22676·7
4407·89	2	*4407·80 " '848 R.	"	"	22680·3
4405·65	1		"	"	22691·8
4404·94	10	4404·88 K. & R.	"	"	22695·5
4401·60	1		"	"	22712·7
4401·50	1	4401·46 "	"	"	22713·2
4400·55	1n		"	"	22718·1
4396·88	1n		"	"	22737·1
4392·50	1n		1·20	"	22759·8
4391·15	1	*4391·152 R.	"	"	22766·8
4389·4	1n	4389·35 K. & R.	"	"	22776
4388·61	2	4388·57 "	"	"	22780·0
4388·07	2	4388·01 "	"	"	22782·8
4385·55	1	4385·40 "	"	"	22795·9
4384·39	2	4384·38 "	"	"	22801·9
4383·71	10	4383·70 "	"	"	22805·4
4382·96	1		"	"	22809·3
4379·40	1n	4379·36 "	"	"	22827·9
4376·96	1n	4376·89 "	1·20	6·3	22840·6
4376·10	4	4376·04 " '102 R.	"	"	22845·1
4374·67	1	4374·59 K. & R.	"	"	22852·6
4373·74	1	4373·67 "	"	"	22857·4
4370·52	1	4370·59 "	"	"	22874·2
4369·96	3	4369·89 " '946 R.	"	"	22877·2
4368·11	1	4368·00 "	"	6·4	22886·8
4367·75	2	4367·68 "	"	"	22888·7
4366·13	1n	4366·02 "	"	"	22897·2
4361·5	1n		"	"	22921
4361·0	1n		"	"	22924
4358·68	1	4358·62 "	"	"	22936·3
4357·73	1n		"	"	22941·3
(4352·90)	3	4352·86 " '910 R.	1·19	"	22966·8
4351·89	2	4351·67 "	"	"	22972·1
4346·63	1	4346·66 "	"	"	22999·9
4343·80	1	4343·81 "	"	"	23014·9
4343·37	1	4343·39 "	"	"	23017·2
4338·89	1		"	"	23041·0
4338·39	1	4338·38 "	"	"	23043·6
4337·22	5	4337·14 "	"	"	23049·8
4334·55	1		"	"	23064·0
4330·35	1n		"	"	23086·4
4330·15	1n		"	"	23087·5
4328·02	1	4328·02 "	"	"	23098·9
4327·22	2	4327·22 "	"	"	23103·1
4326·87	1	4326·86 "	"	"	23105·0
4326·50	1		"	"	23107·0
4325·94	10	†4325·92 " '982 R.	"	"	23110·0
4321·93	1	4321·90 "	"	"	23131·4
4321·67	1		"	"	23132·8
4321·55	1		"	"	23133·4
4320·92	1	4320·89 "	"	"	23136·8

\* Double.

† Triple.

IRON—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4318.75	1	4318.78 K. & R.	1.18	6.4	23148.5
4315.26	5	4315.21    "	"	"	23167.2
4314.46	1	4314.43    "	"	"	23171.5
4312.88	1		"	"	23180.0
4312.48	1		"	"	23182.1
4312.31	1	4312.28    "	"	"	23182.4
4309.51	3	4309.50    "	"	"	23198.1
4309.16	2	4309.14    "	"	"	23200.0
4308.70	1		"	6.5	23202.4
4308.06	10	G 4307.96    "    .023 R.	"	"	23205.8
4305.59	2	4305.58    "	"	"	23219.1
4304.76	1	4304.66    "	"	"	23223.6
4303.32	2	4303.25    "	"	"	23231.4
4302.67	1Ca	4302.68    "	"	"	23234.9
4302.32	1	4302.31    "	"	"	23236.8
4300.94	1	4300.86    "	"	"	23244.2
4299.43	7r	4299.42    "	"	"	23252.4
4298.17	1	4298.16    "	"	"	23259.2
4296.73	1	4296.56    "	"	"	23267.0
4295.12	1n	4295.08    "	"	"	23275.7
4294.32	6	4294.26    "	"	"	23280.1
4292.4	1b	4292.36    "	"	"	23290
4291.62	1	4291.69    "	"	"	23294.7
4291.05	1	4290.99    "	"	"	23297.8
4290.55	1	4290.50    "	"	"	23300.5
4290.08	1n	4290.04    "	"	"	23303.1
4289.47	1n	4289.84    "	"	"	23306.4
4289.0	1n	4289.08    "	"	"	23309
4288.27	1	4288.25    "	"	"	23312.9
4287.10	1n	4287.05    "	"	"	23319.3
4286.55	1	4286.58    "	"	"	23322.3
4285.56	2	4285.57    "	"	"	23327.7
4283.13	1	4283.20    "	"	"	23340.9
4282.60	6	4282.58    "	"	"	23343.8
4280.00	1	4279.99    "	1.17	"	23358.0
4279.65	1	4279.59    "	"	"	23359.9
4278.33	1n	4278.35    "	"	"	23367.1
4277.6	1b		"	"	23371
4276.80	1	4276.80    "	"	"	23375.5
4276.27	1		"	"	23378.4
4276.11	1		"	"	23379.2
4274.02	1	4273.99    "	"	"	23390.7
4273.42	1		"	"	23394.0
4272.53	1	4272.61    "	"	"	23398.8
4271.93	10	4271.93    "	"	"	23402.1
4271.32	7	4271.30    "	"	"	23405.5
4269.90	1	4269.89    "	"	"	23413.2
4269.78	1		"	"	23413.9
4268.86	1	4268.87    "	"	"	23419.0
4267.95	2	*4267.97    "    .941 R.	"	"	23424.0
4267.68	1		"	"	23425.4
4267.56	1		"	"	23426.1
4267.08		4267.08    "	"	"	23428.7

\* Double.



## IRON—continued.

Wave length Spark Spectrum	Intensity and Character	Previous Measurements	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
4265·35	1n	4265·37 K. & R.	1·17	6·5	23438·2
4264·85	1n	4264·88     "	"	"	23441·0
4264·34	1	4264·37     "	"	"	23443·8
4260·64	10	4260·64     "	"	"	23464·2
4259·07	1	4259·06     "	"	"	23472·8
4258·76	1	4258·75     "	"	"	23474·5
4258·40	1n	4258·43     "	"	"	23476·5
4256·40	1n	4256·32     "	"	"	23487·5
4255·61	1	4255·64     "	"	"	23491·9
4255·25	1		"	"	23493·9
4255·06	1	4255·08     "	"	"	23494·9
4254·45	1	4254·45     "     499 R.	"	"	23498·3
4251·55	1		"	6·6	23514·2
4250·95	8	4250·93     "	"	"	23517·6
(4250·30)	7	4250·28     "	"	"	23521·2
4248·37	1	4248·35     "	"	"	23431·8
4247·58	4n	4247·60     "	"	"	23536·2
4246·14	2	4246·18     "	"	"	23544·2
4245·32	3	4245·39     "	"	"	23548·8
4243·45	1	4243·44     "	1·16	"	23559·1
4242·82	1	4242·85     "	"	"	23562·6
4240·46	1	4240·50     "	"	"	23575·7
4239·88	3	4239·90     "	"	"	23579·0
4238·90	4	4238·98     "	"	"	23584·4
4238·10	2	4238·14     "	"	"	23588·9
4237·22	1	4237·26     "	"	"	23593·8
4236·09	8	4236·09     "	"	"	23600·1
4233·74	6	4233·76     "	"	"	23613·2
4233·26	4	4233·25     "	"	"	23615·9
4231·9	1b		"	"	23623
4229·83	1	4229·86     "	"	"	23635·0
4229·58	1	4229·61     "	"	"	23636·4
4227·60	7	4227·60     "	"	"	23647·5
4226·88	5 Ca.	4226·84     "	"	"	23651·5
4226·53	1	4226·52     "	"	"	23653·5
4226·06	1	4226·08     "	"	"	23656·1
4225·57	3	4225·61     "	"	"	23658·8
4224·63	1	4224·63     "	"	"	23664·1
4224·26	3	4224·27     "	"	"	23666·2
4223·30	1	4223·40     "	"	"	23671·6
4222·35	4	4222·35     "	"	"	23676·9
4220·46	2	4220·44     "	"	"	23687·5
4219·51	6	4219·47     "	"	"	23692·8
4217·67	2	4217·69     "	"	"	23703·2
4216·29	2	4216·28     "	"	"	23710·9
4215·56	1	4215·52     "	1·16	"	23715·0
4213·77	2	4213·75     "	"	"	23725·1
4210·52	5	4210·48     "	"	"	23743·4
4208·73	2	4208·71     "	"	"	23753·5
4207·26	2	4207·22     "	"	"	23761·8
4206·84	1	4206·78     "	"	"	23764·2
4206·33	1		"	"	23767·1
4205·69	1n	4205·63     "	1·15	"	23770·7
4204·10	4	4204·07     "	"	"	23779·7
4202·86	1	4202·85     "	"	"	23786·7

IRON—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4202.20	9	4202.15 K. & R.	1.15	6.6	23790.5
4201.07	2	4201.01 "	"	"	23796.9
4200.13	1	4200.01 "	"	6.7	23802.1
4199.27	8	4199.19 " .254 R.	"	"	23807.0
4198.86	1	4198.75 "	"	"	23809.3
4198.50	6	4198.42 "	"	"	23811.3
4196.46	2	4196.66 "	"	"	23822.9
4195.75	1n	4195.71 "	"	"	23826.9
4195.50	3	4195.46 "	"	"	23828.4
4191.80	3n	4191.72 "	"	"	23849.4
4191.61	4	4191.57 "	"	"	23850.5
4188.00	7	4187.92 "	"	"	23871.1
4187.22	7	4187.17 "	"	"	23875.5
4185.03	4	4184.99 " .054 R.	"	"	23888.0
4182.54	2	4182.46 "	"	"	23902.2
4181.94	7	4181.85 "	"	"	23905.6
4179.01	2	4178.95 "	"	"	23922.4
4178.16	1	4178.11 "	"	"	23927.3
4177.74	1	4177.66 "	"	"	23929.7
4176.70	2	4176.62 "	"	"	23935.6
4175.77	4	4175.71 "	"	"	23941.0
4175.06	1	4174.98 "	"	"	23945.1
4174.10	1	4174.00 "	"	"	23950.6
4173.59	2	4173.52 "	"	"	23953.5
4172.88	2	4172.81 "	"	"	23957.6
4172.29	3	4172.20 "	"	"	23961.0
4171.80	1	4171.79 "	"	"	23963.8
4171.05	3	4170.99 "	"	"	23968.1
4168.07	1	4167.96 "	1.14	"	23985.2
4165.57	1n	4165.51 "	"	"	23999.6
4163.8	1n	4163.74 "	"	"	24010
4161.63	1n	4161.57 "	"	"	24022.3
4161.2	1n	4161.13 "	"	"	24025
4158.94	2	4158.89 "	"	"	24037.9
(4157.95)	2	4157.91 " .936 R.	"	"	24043.6
4156.93	4	4156.88 "	"	"	24049.5
4154.92	3	4154.95 "	"	"	24061.2
4154.61	4	4154.57 "	"	"	24062.9
4154.10	3n	4154.04 "	"	"	24065.9
4152.32	1	4152.25 "	"	"	24076.2
4150.40	1	4150.42 "	"	"	24087.4
4149.49	2	4149.44 "	"	"	24092.6
4147.79	2	4147.74 "	"	6.8	24102.4
4145.68	1n	"	"	"	24114.7
4145.45	1n	4145.29 "	"	"	24116.0
4144.62	1	4144.72 "	"	"	24120.9
4144.06	7	4143.96 "	"	"	24124.1
4143.54	5	4143.50 "	"	"	24127.2
4142.01	1	4141.94 "	"	"	24136.1
4140.02	1	"	"	"	24147.7
4139.85	1	4139.96 "	"	"	24148.7
4137.12	4	4137.06 "	"	"	24164.6
4136.68	1	4136.58 "	"	"	24167.2
4136.31	1	"	"	"	24169.3
4134.83	5	4134.77 "	"	"	24178.0



## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4134.54	1	4134.50 K. & R.	1.14	6.8	24179.7
4134.03	1n	4133.96 "	"	"	24182.7
4133.73	1n	4133.67 "	"	"	24184.4
4133.05	4	4132.96 "	"	"	24188.4
(4132.24)	8	4132.15 "	"	"	24193.2
4128.89	1	4128.91 "	1.13	"	24212.8
4127.92	1n	4127.86 "	"	"	24218.5
4127.74	3	4127.68 "	"	"	24219.5
4126.35	2	4126.25 "	"	"	24227.7
4126.05	1	4125.94 "	"	"	24229.5
4125.78	1	4125.71 "	"	"	24231.0
4123.90	1	4123.81 "	"	"	24242.1
4122.69	2	4122.59 "	"	"	24249.2
4121.99	2	4121.88 "	"	"	24253.3
4120.37	2	4120.28 "	"	"	24262.9
4118.72	5	4118.62 "	"	"	24272.6
4115.1	1n	4114.98 "	"	"	24294
4114.61	3	4114.53 "	.593 R.	"	24296.8
4113.14	1	4113.08 "	"	"	24305.5
4109.99	4	4109.88 "	"	"	24324.2
4109.23	1	4109.23 "	"	"	24328.7
4107.65	4	4107.58 "	.636 R.	"	24338.0
4106.60	1	4106.55 "	"	"	24344.2
4106.40	1	4106.37 "	"	"	24345.4
4104.32	1	4104.20 "	"	"	24357.8
4101.73	1	4101.76 "	"	"	24372.9
4101.45	1	4101.37 "	"	"	24374.8
4100.92	1	4100.82 "	"	"	24378.0
4100.37	1n	4100.26 "	"	"	24381.2
4098.37	2	4098.26 "	"	6.9	24393.0
4096.85	2n	4096.67 "	"	"	24402.1
4096.16	2	4096.06 "	"	"	24406.2
4092.5	1n	4092.43 "	1.12	"	24428
4091.76	1	4091.66 "	"	"	24432.5
4091.2	1n	4091.12 "	"	"	24436
4090.2	1n	4090.17 "	"	"	24442
4089.40	1	4089.28 "	"	"	24446.6
4088.73	1	4088.65 "	"	"	24450.6
4088.15	1n	4087.95 "	"	"	24454.0
4087.26	1	4087.16 "	"	"	24459.4
4085.50	3	4085.38 "	"	"	24469.9
4085.16	3	4085.07 "	"	"	24471.9
4084.60	3	4084.59 "	"	"	24475.3
4083.96	1n	4083.90 "	"	"	24479.1
4083.72	1n	4083.70 "	"	"	24480.6
4082.60	1n	4082.55 "	"	"	24487.3
4082.28	1n	4082.20 "	"	"	24489.2
4081.47	1	{ 4081.67 4081.35 }	"	"	24494.1
4081.02	1	4080.96 "	"	"	24496.8
4080.40	1	4080.30 "	"	"	24500.5
4080.02	2	4079.91 "	"	"	24502.8
4078.52	2	4078.41 "	"	"	24511.8
4077.85	1	4077.74 "	"	"	24515.8
4076.81	3	4076.72 "	"	"	24522.1

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4074·97	3	4074·87 K. & R.	1·12	6·9	24533·2
4073·97	2	4073·84 " ·915 R.	"	"	24539·2
4071·92	10	4071·79 "	"	"	24551·5
4070·96	2	4070·85 "	"	"	24557·3
4068·15	3	4068·07 "	"	"	24574·3
4067·77	1	"	"	"	24576·6
4067·45	2	4067·36 "	"	"	24578·5
4067·12	3	4067·04 "	"	"	24580·5
4066·77	1	4066·66 "	"	"	24582·6
4065·57	1	4065·48 "	"	"	24589·9
4064·61	1	4064·55 "	"	"	24595·7
4064·35	1	4064·55 "	"	"	24597·3
4063·75	10	4063·63 "	"	"	24600·9
(4062·60)	3	4062·51 "	"	"	24607·9
4062·13	1n	4062·00 "	"	"	24610·7
4061·3	1b	4061·24 "	"	"	24616
4059·89	1	4059·80 "	"	"	24624·3
4059·75	1	"	"	"	24625·2
4058·93	1	{ 4058·99 } 4058·86 "	"	"	24630·1
4058·40	1	4058·30 "	"	"	24633·4
4057·55	1	4057·43 "	"	"	24638·5
4055·58	1	4055·63 "	"	"	24650·5
4055·12	1n	4055·12 "	"	"	24653·3
4054·95	1n	4054·94 "	1·11	"	24654·3
4054·00	1n	4054·25 "	"	"	24660·1
4053·37	1n	4053·31 "	"	"	24663·9
4052·8	1n	4052·75 "	"	"	24667·0
4052·6	1n	4052·56 "	"	"	24669·0
4052·12	1n	4052·03 "	"	"	24671·5
4051·52	1n	4051·40 "	"	"	24674·8
4050·86	1n	4050·83 "	"	7·0	24679·1
4050·02	2	4049·92 "	"	"	24684·2
4049·50	1	4049·40 "	"	"	24687·4
4049·03	1n	4048·82 " ·875 R.	"	"	24690·3
4047·46	1	4047·40 "	"	"	24699·9
4045·98	10	4045·90 "	"	"	24708·9
4044·79	2	4044·69 "	"	"	24716·2
4044·08	2	4044·00 "	"	"	24720·5
4042·00	2	4041·44 "	"	"	24733·2
4040·86	2	4040·74 "	"	"	24740·2
4038·95	1n	4038·83 "	"	"	24751·9
4034·65	1	4034·59 "	"	"	24778·3
4033·82	1	"	"	"	24783·4
4033·24	1	4033·16 "	"	"	24787·0
4032·80	2	4032·72 "	"	"	24789·7
4032·14	2	4032·06 "	"	"	24793·7
4030·89	2n	4030·84 "	"	"	24801·4
4030·69	2	4030·60 "	"	"	24802·6
4030·37	1	4030·26 "	"	"	24804·6
4029·80	2	4029·72 "	"	"	24808·1
4025·99	1	4025·93 "	"	"	24831·6
4024·94	2	4024·86 "	"	"	24838·1
4024·26	1	4024·20 "	"	"	24842·3
4022·05	3	4022·25 "	"	"	24855·9



## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
4018.42	1	4018.36 K. & R.	1.11	7.0	24878.4
4017.29	3	4017.23 "	"	"	24885.4
4016.57	1	4016.55 "	"	"	24889.9
4014.70	4	4014.63 "	1.10	"	24901.5
4013.96	1	4013.91 "	"	"	24906.1
4011.50	1	4011.49 "	"	"	24921.9
(4009.86)	3	4009.80 "	"	"	24931.5
4009.37	1	"	"	"	24934.6
4008.95	1n	4008.97 "	"	"	24937.2
4007.41	2	4007.36 "	"	"	24946.8
4006.79	1	4006.71 "	"	"	24950.6
4006.47	1	4006.39 "	"	"	24952.6
4005.94	1	"	"	"	24955.9
4005.40	8	4005.33 "	"	"	24959.3
4005.05	1n	4005.07 "	"	"	24961.5
4003.91	1	4003.88 "	"	"	24968.6
4002.75	1	4002.77 "	"	7.1	24975.7
4002.20	1	"	"	"	24979.2
4001.80	2	4001.77 "	"	"	24981.7
4001.49	1	"	"	"	24983.6
4001.37	1	"	"	"	24984.3
4000.60	1	4000.57 "	"	"	24989.2
4000.35	1	4000.36 "	"	"	24990.7
3998.16	3	3998.16 "	"	"	25004.4
3997.52	4	3997.49 "	"	"	25008.4
3997.10	1	3997.06 "	"	"	25011.0
3996.11	1	3996.08 "	"	"	25017.2
3994.22	1	3994.22 "	"	"	25029.0
3990.50	1	3990.48 "	"	"	25052.4
3990.00	1	3989.94 "	"	"	25055.6
3986.29	1	3986.27 "	"	"	25078.9
3985.48	1	3985.46 "	"	"	25084.0
3984.09	3	*3984.08 "	.067 R.	"	25092.7
3982.35	1b	"	"	"	25103.7
3981.90	2	3981.87 "	"	"	25106.5
3977.89	4	3977.83 "	"	"	25131.9
3976.97	1	3976.95 "	"	"	25137.7
3976.72	1	3976.71 "	"	"	25139.3
3973.75	2n	3973.75 "	1.09	"	25158.0
3972.55	1n	"	"	"	25165.6
3971.47	2	3971.41 "	"	"	25172.5
3970.51	1	3970.51 "	"	"	25178.6
3969.40	8	3969.34 "	"	"	25185.6
3968.58	8 C	3968.55 "	"	"	25190.8
3968.10	1	3968.05 "	"	"	25193.9
3967.58	3	3967.51 "	"	"	25197.2
3966.75	3	3966.70 "	"	"	25202.5
3966.20	3	3966.16 "	"	"	25206.0
3964.66	1	3964.61 "	"	"	25215.7
3963.25	1	3963.24 "	"	"	25224.7
3961.30	1n	3961.24 "	"	"	25237.1
3960.40	1n	3960.38 "	"	"	25242.9
3957.15	1n	3957.17 "	"	"	25263.6
3956.82	4	3956.77 "	"	"	25265.7
3956.58	3	3956.54 "	"	"	25267.3

\* Double.

B

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3955.50	1n	3955.50 K. & R.	1.09	7.2	25274.1
3953.25	1	3953.25	"	"	25288.4
3952.74	2	3952.71	"	"	25291.7
3951.30	3	3951.25	"	"	25300.9
(3950.10)	3	3950.05	"	"	25308.6
3948.88	4	3948.87	"	"	25316.4
3948.31	3	3948.23	"	"	25320.1
3947.64	2	3947.64	"	"	25324.4
3947.10	1	3947.11	"	"	25327.9
3945.22	1n	3945.22	"	"	25339.9
3945.00	1n	3945.00	"	"	25341.3
3943.45	1	3943.43	"	"	25351.3
3942.55	2	*3942.54	"	"	25357.1
3941.40	1n	3941.40	"	"	25364.5
3940.99	2	3940.98	"	"	25367.1
3939.06	1n		"	"	25379.6
3937.67	1		"	"	25388.5
3937.42	1	3937.42	"	"	25390.1
3935.90	2	3935.92	1.08	"	25399.9
3935.41	1	3935.40	"	"	25403.1
3934.18	1		"	"	25411.1
3933.80	8 Ca	3933.75	"	"	25413.5
3933.05	1	3933.01	"	"	25418.4
3932.75	2	3932.71	"	"	25420.3
3931.96	1		"	"	25425.4
3931.22	1	3931.22	"	"	25430.2
3930.43	6	3930.37	"	"	25435.3
3929.82	1		"	"	25439.3
3929.26	1	3929.24	"	"	25442.9
3928.09	7	3928.17	"	"	25450.5
3926.06	2	3926.05	"	"	25463.6
3925.76	1	3925.74	"	"	25465.6
3925.33	1n	3925.31	"	"	25468.4
3923.05	6	3923.00	"	"	25483.2
3920.40	5	3920.36	"	"	25500.4
3919.17	2	3919.18	"	"	25508.4
3918.75	3	3918.74	"	"	25511.1
3918.47	3n	3918.49	"	"	25513.0
3917.28	3	3917.29	"	"	25520.7
3916.84	3	3916.82	"	"	25523.6
3914.39	1	3914.35	"	"	25539.6
3913.74	1	3913.74	"	"	25543.8
3910.95	1	3910.95	"	"	25562.0
3909.95	1n	3909.95	"	"	25568.6
3908.06	1	3908.02	"	7.3	25580.8
3907.60	1	3907.58	"	"	25583.9
3906.87	1n	3906.84	"	"	25588.6
3906.59	5	3906.58	"	"	25590.5
3906.2	1n		"	"	25593.0
3904.00	2	3904.00	"	"	25607.5
3903.65	1		"	"	25609.7
3903.09	7	3903.06	"	"	25613.4
3900.63	1	3900.64	"	"	25529.6

\* Double.



## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3899·84	6	3899·80 K. & R.	1·08	7·3	25634·8
3899·12	1	3899·13   "		"	25639·5
3898·05	4	3898·05   "	"	"	25646·6
3897·58	1	3897·54   " 605 R.	"	"	25649·6
3895·78	5	3895·75   "	1·07	"	25661·5
3894·10	1	3894·09   "	"	"	25672·6
3893·50	3	3893·47   "	"	"	25676·5
3892·05	2	3892·02   "	"	"	25686·1
3890·96	1	3890·94   "	"	"	25693·3
3888·95	2n	3888·92   "	"	"	25706·6
3888·65	6	3888·63   "	"	"	25708·6
3887·18	5	3887·17   "	"	"	25718·3
3886·41	8	3886·38   "	"	"	25723·4
3885·63	3	3885·61   "	"	"	25728·6
3885·30	1	3885·25   "	"	"	25730·7
3884·49	2	3884·46   "	"	"	25736·1
3883·44	2	3883·39   "	"	"	25743·1
3278·71	8	3878·82   "	"	"	25775·5
3878·15	7	3878·12   "	"	"	25778·2
3876·15	1	3876·14   "	"	"	25791·5
3873·89	4	3873·88   "	"	"	25806·5
3872·65	6	3872·61   "	"	"	25814·8
3871·88	3	3871·86   "	"	"	25820·0
3869·69	2	3869·69   "	"	"	25834·6
3868·03	1	3868·03   "	"	"	25845·6
3867·33	3	3867·33   "	"	"	25850·3
3865·67	6	3865·65   "	"	"	25861·4
3863·86	1	3863·87   "	"	"	25873·6
3861·46	1	3861·46   "	"	"	25889·6
3860·07	9	3860·03   "	"	"	25899·0
3859·36	4	3859·34   "	"	"	25903·7
3857·03	1		"	"	25919·4
3856·51	8	3856·49   "	1·06	"	25922·9
3855·45	1n	3855·45   "	"	"	25930·0
3854·52	1n	3854·51   "	"	"	25936·3
3853·6	1b	3853·60   "	"	"	25943
3852·71	2	3852·71   "	"	"	25948·5
3850·99	3	3850·96   "	"	"	25960·0
3850·69	1		"	"	25962·1
3850·15	6	3850·11   "	"	"	25965·7
3848·47	1	3848·42   "	"	"	25977·1
3846·91	3	3846·96   "	"	"	25987·6
3846·54	2	3846·55   "	"	"	25990·1
3846·18	1	3846·18   "	"	"	25992·5
3845·82	1	3845·84   "	"	"	25995·0
3845·30	1	3845·30   "	"	"	25998·5
3844·45	1n		"	"	26004·3
3843·41	4	3843·40   "	"	"	26011·3
3841·21	8	3841·19   "	"	"	26026·2
3840·61	8	3840·58   "	"	"	26030·2
3839·87	2	3839·78   "	"	"	26035·3
3839·40	4	3839·38   "	"	"	26038·4
3838·2	1b		"	"	26047
3837·25	1	3837·27   "	"	"	26053·0
3836·44	2	3836·48   "	"	"	26058·5

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3834·82	1		1·06	7·3	26069·5
3834·38	8	3834·37 K. & R.	"	"	26072·5
3833·44	3	3833·44 "	"	"	26078·9
3832·4	1b		"	"	26086
3831·77	1		"	"	26090·3
3830·96	1	3830·95 "	"	"	26095·8
3830·53	1n	3830·54 "	"	"	26098·8
3829·85	1	3829·86 "	"	"	26103·4
3829·56	1	3829·59 "	"	"	26105·4
3829·25	1	3829·30 "	"	"	26107·5
3827·98	9	3827·96 "	"	"	26116·1
3826·96	1	3826·99 "	"	"	26123·1
3826·04	9	3826·04 "	"	"	26129·4
3825·10	1		"	"	26135·8
3824·58	7	3824·58 "	"	"	26139·4
3821·96	2	3821·98 "	"	"	26157·3
3821·30	4	3821·32 "	"	"	26161·8
3820·57	9	3820·56 "	"	"	26166·8
3819·80	1n	3819·75 "	"	"	26172·1
3817·77	1n	3817·84 "	"	7·4	26185·9
3816·46	1	3816·48 "	1·05	"	26194·9
3815·99	9	3815·97 "	"	"	26198·1
3814·90	1	3814·94 "	"	"	26205·6
3814·65	2	3814·66 "	"	"	26207·3
3814·01	1	3814·03 "	"	"	26211·7
3813·77	1	3813·77 "	"	"	26213·4
3813·12	5	3813·12 "	"	"	26217·8
3812·04	1n	3812·03 "	"	"	26225·3
3810·87	1	3810·89 "	"	"	26233·3
3809·70	1	3809·70 "	"	"	26241·4
3808·85	1	3808·86 "	"	"	26247·2
3807·65	2	3807·68 "	"	"	26255·5
3806·81	4	3806·84 "	"	"	26261·3
3806·34	1	3806·36 "	"	"	26264·6
3805·48	5	3805·47 "	"	"	26270·5
3804·15	1	3804·15 "	"	"	26279·7
3802·40	1	3802·41 "	"	"	26291·8
3801·87	1n		"	"	26295·4
3801·80	1	3801·81 "	"	"	26295·9
3799·70	7	3799·68 "	"	"	26310·5
3798·68	6	3798·65 "	"	"	26317·5
3797·64	4	3797·65 "	"	"	26324·7
3795·15	6	3795·13 "	"	"	26342·0
3794·48	2	3794·46 "	"	"	26346·7
3794·00	1	3793·99 "	"	"	26350·0
3793·60	1n	3793·60 "	"	"	26352·8
3792·29	1	3792·28 "	"	"	26361·9
3790·92	1	3790·88 "	"	"	26371·4
3790·23	3	3790·22 "	"	"	26376·2
3789·31	1	3789·31 "	"	"	26382·6
3788·02	5	3788·01 "	"	"	26391·6
3787·30	1	3787·30 "	"	"	26396·6
3786·82	2	3786·81 "	"	"	26400·0
3786·30	2	3786·30 "	"	"	26403·6
3786·06	3	3786·07 "	"	"	26405·3



## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3782.07	1n	3782.05 K. & R.	1.05	7.4	26433.2
3781.31	1	3781.31 "	"	"	26438.5
3779.59	1	3779.58 "	"	"	26450.5
3778.64	1	3778.63 "	"	"	26457.2
3777.56	1	3777.56 "	"	"	26464.7
3777.22	1	3777.20 "	"	"	26467.1
3776.67	1	3776.58 "	1.04	"	26471.0
3774.95	1	3774.95 "	"	"	26483.0
3773.83	1	3773.84 "	"	"	26490.9
3771.10	1n	"	"	7.5	26510.0
3770.44	1	3770.43 "	"	"	26514.6
3770.13	1	3770.12 "	"	"	26516.8
3768.14	1	3768.15 "	"	"	26530.8
3767.32	7	3767.31 "	"	"	26536.6
3766.78	1	3766.74 "	"	"	26540.4
3766.20	1	3766.19 "	"	"	26544.5
3765.70	5	3765.66 "	"	"	26548.0
3763.91	7	3763.90 "	"	"	26560.6
3763.1	1b	"	"	"	26566
3762.2	1b	3762.30 "	"	"	26573
3761.50	1n	3761.52 "	"	"	26577.6
3760.68	2	3760.66 "	"	"	26583.4
3760.19	3	3760.17 "	"	"	26586.9
3759.62	1b	"	"	"	26590.9
3759.35	1b	3759.30 "	"	"	26592.8
3758.92	1	"	"	"	26595.9
3758.39	8	3758.36 "	"	"	26599.6
3757.60	1	3757.60 "	"	"	26605.2
3757.08	2	3757.06 "	"	"	26608.9
(3756.21)	1	3756.17 "	"	"	26615.1
3754.62	1n	*3754.63 " .652 R.	"	"	26626.4
3753.74	3	3753.74 "	"	"	26632.6
3753.4	1n.	"	"	"	26635
3752.56	1	3752.57 "	"	"	26641.0
3752.2	1b	"	"	"	26644
3749.64	10	3749.61 "	"	"	26661.7
3749.05	2	3749.06 "	"	"	26665.9
3748.41	7	3748.39 "	"	"	26670.5
3747.02	2	*3747.09 " .094 R.	"	"	26680.4
3746.55	1	3746.56 "	"	"	26683.7
3746.04	7	3745.95 "	"	"	26687.4
3745.71	7	3745.67 "	"	"	26689.7
3744.70	1	"	"	"	26696.9
3744.60	1	"	"	"	26697.6
3744.20	1	3744.21 "	"	"	26700.5
3743.51	7	{ 3743.58 "	"	"	26705.4
		{ 3743.45 "	"	"	
3742.73	1	3742.77 "	"	"	26711.0
3741.95	1n	"	"	"	26716.5
3740.9	1n	"	"	"	26724
3740.39	1	3740.44 "	"	"	26727.7
3740.18	1	3740.22 "	"	"	26729.2
3739.65	1	3739.73 "	"	"	26733.0
3738.40	3	3738.44 "	"	"	26741.9
3737.27	8	3737.27 "	1.03	"	26750.0

\* Double.

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
3735.44	3	3735.45 K. & R.	1.03	7.5	26763.1
3735.01	10	3735.00 "	"	"	26766.2
3733.46	6	3733.46 "	"	"	26777.3
3732.50	4	3732.54 "	"	"	26784.2
3731.50	1	3731.51 "	"	"	26791.4
3731.05	1	3731.07 "	"	"	26794.6
3730.51	2	3730.53 "	"	"	26798.5
3728.78	1	3728.81 "	"	"	26810.9
3727.78		3727.78 "	"	7.6	26818.0
3727.23		3727.13 "	"	"	26822.0
3727.02			"	"	26823.5
3725.60	1	3725.62 "	"	"	26833.7
3724.49	3	3724.51 "	"	"	26841.7
3722.73	6	3722.69 "	"	"	26854.4
3722.06	1	3722.07 "	"	"	26859.2
3721.68	ln	3721.69 "	"	"	26862.0
3721.35	1	3721.41 "	"	"	26864.4
3720.10	8	3720.07 "	"	"	26873.4
3718.53	1	3718.55 "	"	"	26884.7
3716.54	3	3716.59 "	"	"	26899.2
3716.01	1	3716.04 "	"	"	26903.0
3711.52	1	3711.54 "	"	"	26935.5
3711.33	1	3711.35 "	"	"	26936.9
3709.40	6	3709.37 "	"	"	26950.9
3708.06	5	3708.03 "	"	"	26960.7
3708.01	2		"	"	26961.0
3707.65	ln	3707.60 "	"	"	26963.7
3707.16	2	3707.18 "	"	"	26967.2
3705.73	6	3705.70 "	"	"	26977.6
3704.59	3	3704.59 "	"	"	26985.9
3703.95	1	3703.96 "	"	"	26990.6
3703.81	1	3703.83 "	"	"	26991.6
3703.67	1	3703.68 "	"	"	26992.6
3702.60	1	3702.63 "	"	"	27000.5
3702.17	1	3702.16 "	"	"	27003.6
3701.20	4	3701.20 "	"	"	27010.7
3698.75	1	3698.73 "	"	"	27028.6
3697.58	2	3697.58 "	1.02	"	27037.1
(3695.20)	3	3695.18 "	"	"	27054.5
3694.13	4	3694.13 "	"	"	27062.4
3693.20	1	3693.16 "	"	"	27069.2
3690.87	2	3690.86 "	"	"	27086.3
3690.60	1	3690.60 "	"	"	27088.3
3689.57	3	3689.58 "	"	"	27095.8
3688.64	ln	3688.65 "	"	"	27102.7
3687.70	3	3687.77 "	"	"	27109.6
3687.55	6	3687.58 "	"	"	27110.7
3687.24	1	3687.21 "	"	"	27113.0
3686.38	1	3686.40 "	"	"	27119.3
3686.13	3	3686.10 "	"	"	27121.1
3684.25	4	3684.24 "	"	"	27135.0
3683.19	3	3683.18 "	"	7.7	27142.7
3682.35	4	3682.35 "	"	"	27148.9
3680.88	1b	3680.90 "	"	"	27159.7
3680.06	5	3680.03 "	"	"	27165.8



## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3678.97	1	3678.99 K. & R.	1.02	7.7	27173.8
3677.71	4	3677.76 "	"	"	27183.1
3677.42	2	3677.42 "	"	"	27185.3
3676.42	2	3676.44 "	"	"	27192.7
3674.88	1	3674.89 "	"	"	27204.1
3674.6	1n	3674.55 "	"	"	27206
3670.92	1	3670.95 "	"	"	27233.4
3670.19	2	3670.20 "	"	"	27238.8
3669.63	3	3669.65 "	"	"	27243.0
3669.26	1	3669.29 "	"	"	27245.8
3668.11	1n	3668.11 "	"	"	27254.3
3667.38	1	3667.45 "	"	"	27259.7
3666.38	1n	3666.41 "	"	"	27267.2
3664.71	1n	3664.74 "	"	"	27279.6
3663.56	1n	3663.60 "	"	"	27288.2
3662.98	1n	3663.04 "	"	"	27292.5
3659.63	2	3659.65 "	"	"	27317.5
3658.07	1n	3658.07 "	"	"	27329.1
3657.25	1	3657.27 "	1.01	"	27335.3
3656.33	1	3656.37 "	"	"	27342.1
3655.70	1n	"	"	"	27346.8
3655.57	1	3655.60 "	"	"	27347.8
3653.71	1	3653.90 "	"	"	27361.7
3651.60	4	3651.61 "	"	"	27377.6
3650.40	2	3650.42 "	"	"	27386.6
3650.13	1	3650.14 "	"	"	27388.6
3649.62	4	3649.65 "	"	"	27392.4
3649.41	1	3649.44 "	"	"	27394.0
(3648.00)	9	3647.99 "	"	"	27404.6
3647.56	1	3647.57 "	"	"	27407.9
3645.93	2	3645.96 "	"	"	27420.1
3645.65	1	3645.63 "	"	"	27422.3
3645.20	1	3645.22 "	"	"	27425.6
3643.80	1n	3643.80 "	"	"	27436.2
3640.53	5	3640.53 "	"	"	27460.8
3638.42	4	3638.44 "	"	7.8	27476.7
3637.98	1	3637.98 "	"	"	27480.0
3637.40	1	3637.39 "	"	"	27484.4
3637.11	1	3637.16 "	"	"	27486.6
3636.77	1	3636.73 "	"	"	27489.1
3636.32	1	3636.32 "	"	"	27492.5
3635.3	1n	3635.39 "	"	"	27500
3634.8	1b	3634.80 "	"	"	27504
3634.45	1n	3634.48 "	"	"	27506.7
3633.97	1n	3633.98 "	"	"	27510.3
3633.12	1	3633.16 "	"	"	27516.8
3632.65	1	3632.71 "	"	"	27520.3
3632.15	2	3632.20 "	"	"	27524.0
3631.64	10	3631.62 "	"	"	27528.0
3631.23	2	3631.23 "	"	"	27531.1
3630.50	1	3630.50 "	"	"	27536.6
3628.0	1n	3627.91 "	"	"	27556
3625.27	1	3625.30 "	"	"	27576.4
3625.00	1n	3624.95 "	"	"	27578.4
3624.5	1n	3624.46 "	"	"	27582

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
3623·92	1	3623·94 K. & R.	1·01	7·8	27586·6
3623·58	1	3623·58 "	"	"	27589·2
3623·31	2	3623·33 "	"	"	27591·3
3622·15	3	3622·15 "	"	"	27600·1
3621·7	1b	3621·87 "	"	"	27604
3621·60	4	3621·61 "	"	"	27604·3
3620·65	1n	3620·62 "	"	"	27611·6
3619·7	1n	{ 3619·89 "			27619
		3619·54 "		"	
3618·92	10	3618·92 "	"	"	27624·8
3618·50	2	3618·54 "	"	"	27628·0
3617·90	4	3617·94 "	1·00	"	27632·5
3617·44	1	3617·47 "	"	"	27636·1
3616·68	1	{ 3616·76 "			27641·9
		3616·46 "	"	"	
3615·30	1n	3615·41 "	"	"	27652·4
3614·8	1b	3614·78 "	"	"	27656
3614·27	1n	3614·26 "	"	"	27660·3
3613·6	1n	{ 3613·75 }			27665
		3613·58 "	"	"	
3613·3	1n	3613·26 "	"	"	27668
3613·1	1n	3613·10 "	"	"	27669
3612·6	1n		"	"	27673
3612·24	1	3612·25 "	"	"	27675·9
3610·82	1	3610·86 "	"	"	27686·7
3610·30	4	3610·29 "	"	"	27690·7
3609·51	1		"	"	27696·8
3609·02	9	3608·99 "	"	"	27700·6
3607·30	1		"	"	27713·8
3606·85	6	3606·83 "	"	"	27717·2
3605·60	5	3605·62 "	"	"	27726·8
3605·40	1n		"	"	27728·4
3603·96	1	3603·98 "	"	"	27739·5
3603·35	3	3603·34 "	"	"	27744·2
3602·64	1	3602·64 "	"	"	27749·6
3599·77	1	3599·77 "	"	"	27771·8
3599·30	1	3599·30 "	"	"	27775·4
3597·20	1n	3597·22 "	"	"	27791·6
3596·3	1n	3596·35 "	"	"	27799
3595·4	1n	3595·43 "	"	"	27806
3594·78	2	3594·71 "	"	7·9	27810·2
3589·58	1	3589·58 "	"	"	27850·5
3589·24	1	3589·25 "	"	"	27853·1
3589·05	1	3589·05 "	"	"	27854·6
3588·75	1	3588·75 "	"	"	27857·0
3587·87	1	3587·87 "	"	"	27863·8
3587·56	1	3587·55 "	"	"	27866·1
3587·10	5	3587·10 "	"	"	27869·8
3586·25	4	3586·24 "	"	"	27876·4
3585·85	4	3585·84 "	"	"	27879·5
3585·49	5	3585·43 "	"	"	27882·3
3585·10	3	3585·08 "	"	"	27885·3
3584·81	4	3584·78 "	"	"	27887·6
3583·48	1	3583·45 "	"	"	27897·9
3582·35	2	3582·32 "	"	"	27906·7



## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3581·36	10r	3581·32 K. & R.	1·00	7·9	27914·5
3578·78	1	3578·80 "	"	"	27934·6
3578·53	1	3578·49 "	"	"	27936·5
3577·8	1n	"	0·99	"	27942
3576·90	1	3576·89 "	"	"	27949·3
3576·17	1n	3576·11 "	"	"	27955·0
3575·52	1	3575·49 "	"	"	27960·1
3574·04	2	3574·00 "	"	"	27971·6
3573·55	1	3573·52 "	"	"	27975·5
3572·75	1n	3572·79 "	"	"	27981·7
3572·13	2	3572·12 "	"	"	27986·6
3571·38	1	3571·34 "	"	"	27992·5
3570·42	8	3570·45 "	"	"	28000·0
3570·18	8	3570·23 "	"	"	28001·9
3569·12	1	3569·09 "	"	"	28010·2
3569·00	1	3568·94 "	"	"	28011·2
3568·55	1	3568·53 "	"	"	28014·7
3567·20	1	3567·15 "	"	"	28025·3
3566·75	1n	3566·70 "	"	"	28028·8
3566·25	1n	3566·46 "	"	"	28032·8
3565·54	8r	3565·50 "	"	"	28038·4
3564·67	1	3564·61 "	"	"	28045·2
3562·0	1b	"	"	"	28066
3560·83	1	3560·81 "	"	"	28075·4
3559·65	1	3559·62 "	"	"	28084·8
3558·68	6	3558·62 "	"	"	28092·4
3557·02	3	3556·99 "	"	"	28105·5
3555·09	5	3555·04 "	"	"	28120·8
3554·7	1n	3554·62 "	"	"	28124
3554·32	1	3554·24 "	"	"	28126·9
3553·91	2	3553·84 "	"	"	28130·1
3553·01	1	3552·95 "	"	"	28137·3
3552·28	1	3552·24 "	"	"	28143·0
3549·98	1	3549·97 " 011 R.	"	8·0	28161·2
3548·17	1	3548·13 "	"	"	28175·5
3547·33	1	3547·31 "	"	"	28182·2
3545·76	2	3545·74 "	"	"	28194·7
3544·75	1	3544·74 "	"	"	28202·7
3543·82	1	3543·78 "	"	"	28210·1
3543·60	1n	3543·53 "	"	"	28211·9
3542·21	5	3542·20 "	"	"	28223·0
3541·23	4	3541·22 "	"	"	28230·8
3540·90	1n	3548·82 "	"	"	28233·4
(3540·27)	1	3540·24 " 266 R.	"	"	28238·4
3538·06	1	3538·01 "	"	"	28256·1
3537·88	1	3537·84 "	0·98	"	28257·5
3537·68	1	3537·60 "	"	"	28259·1
3536·59	4	3536·65 "	"	"	28267·8
3533·36	3	3533·30 "	"	"	28293·7
3533·12	2	3533·08 "	"	"	28295·6
3530·55	1	3530·48 "	"	"	28316·2
3529·97	2	3529·90 "	"	"	28320·9
3527·94	2	3527·90 "	"	"	28337·2
3526·83	2	3526·76 "	"	"	28346·1
3526·60	3	3526·51 "	"	"	28347·9

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3526·31	4	3526·25 K. & R.	0·98	8·0	28350·3
3526·15	4	3526·08 "	"	"	28351·5
3524·38	2	3524·34 "	"	"	28365·7
3524·22	1	3524·15 "	"	"	28367·1
3523·47	1	3523·38 "	"	"	28373·1
3522·43	1	3522·37 "	"	"	28381·5
3521·99	1	3521·93 "	"	"	28385·0
3521·41	6	3521·36 "	"	"	28389·7
3519·00	1n	3518·96 "	"	"	28409·2
3516·53	1	3516·50 "	"	"	28429·1
3513·96	5	3513·91 "	"	"	28449·9
3513·17	1n	3513·15 "	"	"	28456·3
3510·55	1	3510·52 "	"	8·1	28477·5
3510·0	1n	3509·95 "	"	"	28482
3508·63	1	3508·58 "	"	"	28493·1
3506·64	1	3506·59 "	"	"	28509·2
3505·20	1	{ 3505·39 } 3505·15 "	"	"	28520·9
3504·99	1	3504·95 "	"	"	28522·7
3500·71	1	3400·64 "	"	"	28557·5
3498·00	5	3497·92 "	0·97	"	28579·7
3497·26	3	3497·20 "	"	"	28585·7
3495·44	2	3495·37 "	"	"	28600·6
3494·9	1n	3494·76 "	"	"	28605
3493·63	2	3493·78 "	"	"	28615·4
3490·73	6	3490·65 "	"	"	28639·2
3489·82	1	3489·74 "	"	"	28646·7
3485·49	2	3485·42 "	"	"	28682·3
3483·15	1	3483·09 "	"	"	28701·5
3478·80	1n	3478·69 "	"	"	28737·4
3478·00	1n	3477·93 "	"	"	28744·1
3476·85	5	3476·75 "	"	"	28753·6
3475·61	7	3475·52 "	"	"	28763·8
3474·59	1	3474·51 "	"	"	28772·3
3471·46	2	3471·40 "	"	"	28798·2
3469·97	1	3469·91 "	"	8·2	28810·5
3469·13	1n	3469·09 "	"	"	28817·5
3468·94	1	3468·92 "	"	"	28819·0
3468·80	1	"	"	"	28820·2
3466·01	7	3465·95 "	"	"	28843·4
3460·04	1	3460·02 "	"	"	28893·2
3458·44	1	3458·39 "	0·96	"	28906·6
3457·05	1n	3457·15 "	"	"	28918·2
3453·13	1	3453·10 "	"	"	28951·0
3452·41	2	3452·35 "	"	"	28957·1
3452·16	2	"	"	"	28959·2
3451·80	1n	3451·99 "	"	"	28962·2
3450·47	2	3450·41 "	"	"	28973·4
3447·43	2	3447·37 "	"	"	28998·9
3445·30	4	3445·22 "	"	"	29016·9
(3444·03)	5	3443·96 "	"	"	29027·5
3442·82	1	3442·75 "	"	"	29037·8
3442·51	1	3442·44 "	"	"	29040·4
3441·16	6	3441·07 "	"	"	29051·8
3440·77	7	3440·69 "	"	"	29055·1



IRON—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3440.02	1	3439.93 K. & R.	0.96	8.2	29061.4
3438.42	1	3438.36 "	"	"	29074.9
3438.19	1	3438.02 "	"	"	29076.9
3436.25	1n	3436.06 "	"	"	29093.3
3433.72	1	3433.64 "	"	"	29114.7
3431.98	1	3431.90 "	"	8.3	29129.4
3428.35	2	3428.26 "	"	"	29160.3
3427.29	5	3427.21 "	"	"	29169.3
3426.81	2	3426.71 "	"	"	29173.4
3426.53	2	3426.44 "	"	"	29175.7
3425.17	1	3425.08 "	"	"	29187.3
3424.45	3	3424.36 "	"	"	29193.5
3422.82	2		"	"	29207.4
3422.68	1	3422.69 "	"	"	29208.6
3418.66	3	3418.58 "	"	"	29242.9
3417.99	3	3417.92 "	0.95	"	29248.7
3415.70	1	3415.61 "	"	"	29268.3
3413.31	5	3413.22 "	"	"	29288.8
3411.50	1	3411.43 "	"	"	29304.3
3410.30	1	3410.26 "	"	"	29314.6
3407.62	6	3407.55 "	"	"	29337.7
3406.96	2	3406.88 "	"	"	29343.4
3406.62	1n	3406.50 "	"	"	29346.3
3404.50	3	3404.41 "	"	"	29364.6
3402.42	2	3402.33 "	"	"	29382.5
3401.68	1	3401.60 "	"	"	29389.2
(3399.49)	5	3399.39 "	"	"	29407.9
3398.45	1n	3398.29 "	"	"	29416.9
3397.75	1n	3397.68 "	"	"	29422.9
3397.10	1	3397.05 "	"	"	29428.6
3396.1	1b	3396.13 "	"	8.4	29437
3395.46	1n		"	"	29442.7
3394.72	1	3394.65 "	"	"	29449.1
3392.80	3	3392.74 "	"	"	29465.8
3392.43	2	3392.37 "	"	"	29469.0
3392.13	1	3392.12 "	"	"	29471.6
3389.85	1	3389.83 "	"	"	29491.4
3387.50	1	3387.48 "	"	"	29511.9
3384.11	2	3384.05 "	"	"	29541.5
3383.84	1	3383.80 "	"	"	29543.8
3383.00	1		"	"	29547.6
3382.52	1	3382.48 "	"	"	29555.4
3381.15	1n		"	"	29567.3
3380.25	3	3380.17 "	"	"	29575.2
3379.11	2	3379.11 "	"	"	29585.2
3378.76	2	3378.77 "	"	"	29588.3
3372.90	1	3372.90 "	0.94	"	29639.7
3372.18	1	3372.18 "	"	"	29646.0
3370.92	4	3370.87 "	"	"	29657.1
3369.69	3	3369.62 "	"	"	29667.9
3366.92	2	3366.88 "	"	"	29692.3
3361.31	1	3361.03 "	"	"	29741.9
3360.2	1b		"	8.5	29752
3358.4	1b	3358.41 "	"	"	29768
3356.49	1	3356.44 "	"	"	29784.5

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3355·35	2	3355·27 K. & R.	0·94	8·5	29794·7
3354·14	1	3354·16 "	"	"	29805·4
3351·89	1	3351·85 { "	"	"	29825·4
3351·83	1		"	"	29826·0
3351·63	1	3351·65 "	"	"	29827·7
3349·48	1	"	"	"	29846·9
3349·11	1	"	"	"	29850·2
(3348·01)	1	3348·03 "	"	"	29860·0
3347·00	1	3347·03 "	"	"	29869·0
3342·37	1	3342·35 "	"	"	29883·4
3341·99	1	3342·01 "	"	"	29913·8
3340·65	1	3340·64 "	"	"	29925·8
3339·28	1	3339·24 "	"	"	29938·1
3338·65	1b	3338·76 "	0·95	"	29943·7
3337·86	1	3337·73 "	"	"	29950·8
3336·33	1	3336·30 "	"	"	29964·6
3335·36	1	"	"	"	29973·3
3334·32	1	3334·31 "	"	"	29982·6
3331·70	1	3331·74 "	"	"	30006·2
3328·95	2	3329·00 "	"	"	30031·0
3325·56	1	3325·56 "	"	"	30061·6
3324·65	1	3324·62 "	"	8·6	30069·8
3323·87	1	"	"	"	30076·8
3323·83	2	3323·84 "	"	"	30077·2
3323·21	2	"	"	"	30082·8
3322·65	1n	3322·65 "	"	"	30087·9
3319·40	1	3319·35 "	"	"	30117·3
3318·7	1b	"	"	"	30124
3316·21	1	"	"	"	30146·3
3314·87	2	3314·86 "	"	"	30158·5
3310·57	1	3310·53 "	"	"	30197·7
3310·48	1	"	"	"	30198·5
3307·85	1	3307·87 "	"	"	30222·5
3306·49	6	3306·50 "	"	"	30235·0
3306·10	6	3306·09 "	"	"	30238·5
3303·65	1n	3303·69 "	"	"	30260·9
3303·00	1n	"	"	"	30266·9
3302·0	1b	3302·02 "	"	"	30276
3301·3	1b	3301·35 "	"	"	30283
3298·26	1	3298·25 "	0·92	"	30310·4
3298·04	1	"	"	"	30312·4
3297·00	1	3296·91 "	"	"	30322·0
3295·95	1	3295·94 "	"	"	30331·7
3295·35	1n	"	"	"	30337·2
3292·74	2	3292·70 "	"	"	30361·2
3292·16	2	3292·13 "	"	"	30366·6
3291·15	1	3291·10 "	"	"	30375·9
3289·49	2	3289·51 "	"	"	30391·3
3286·90	5	3286·87 "	"	8·7	30415·1
3285·65	1	3285·50 "	"	"	30426·7
3284·72	1	3284·71 "	"	"	30435·3
3283·02	1	3283·00 "	"	"	30451·1
3281·44	2	3281·40 "	"	"	30465·7
3280·42	2	3280·37 "	"	"	30475·2
3279·8	1b	3279·87 "	"	"	30481



## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3278.87	1n	3278.83 K. & R.	0.92	8.7	30499.6
3277.48	3	3277.42 "	"	"	30502.6
3276.75	1n	3276.55 "	"	"	30509.3
3274.11	3	3274.05 "	"	"	30534.0
3273.70	1n		"	"	30537.8
3271.16	3	3271.12 "	"	"	30561.5
3268.67	1n		"	"	30584.8
3268.34	1	3268.33 "	"	"	30587.9
3267.13	1		"	"	30599.2
3267.06	1		"	"	30599.9
3265.76	3	3265.73 "	"	"	30612.0
3265.16	1	3265.15 "	"	"	30617.7
3264.64	1	3264.60 "	"	"	30622.5
3262.45	1	3262.40 "	"	"	30643.1
3260.40	1	3260.32 "	"	"	30662.4
3260.11	1	3260.09 "	"	"	30665.1
3259.20	3	3259.15 "	0.91	"	30673.7
3258.90	3		"	"	30676.5
3257.73	1	3257.69 "	"	"	30687.5
3256.01	2	3255.97 "	"	"	30703.7
(3254.50)	2	3254.47 "	"	"	30718.0
3253.75	1	3253.70 "	"	"	30725.1
3253.06	1	3253.00 "	"	"	30731.6
3251.40	1	3251.31 "	"	8.8	30747.2
3250.80	1n	3250.75 "	"	"	30752.9
3249.81	1	3249.94 "	"	"	30762.2
3249.35	1n	3249.27 "	"	"	30766.6
3248.31	1	3248.31 "	"	"	30776.4
3247.66	3	3247.70 "	"	"	30782.6
3247.32	3	3247.39 "	"	"	30785.8
3247.10	1	3247.08 "	"	"	30787.9
3246.60	1n	3246.55 "	"	"	30792.7
3246.12	1	3246.09 "	"	"	30797.2
3244.31	2	3244.27 "	"	"	30814.4
3243.85	2	3243.94 "	"	"	30818.8
3239.55	3	3239.53 "	"	"	30859.7
3237.95	2	3237.92 "	"	"	30874.9
3237.53	1	3237.43 "	"	"	30878.9
3236.70	1n	3236.88 "	"	"	30886.9
3236.33	1	3236.31 "	"	"	30890.4
3234.72	1	3234.71 "	"	"	30905.8
3234.11	1	3234.07 "	"	"	30911.6
3233.19	2	3233.14 "	"	"	30920.4
3232.94	1		"	"	30922.8
3231.85	1	3231.72 "	"	"	30933.2
3231.12	2	3231.05 "	"	"	30940.2
3230.36	1	3230.29 "	"	"	30947.5
3230.14	1		"	"	30949.6
3230.00	1n	3230.01 "	"	"	30951.0
3229.27	1	3229.19 "	"	"	30958.0
3229.03	1	3228.97 "	"	"	30960.3
3228.36	1	3228.36 "	"	"	30966.7
3227.92	6	3227.88 "	"	"	30970.9
3225.90	5	3225.90 "	"	"	30990.3
3222.19	4	3222.12 "	"	"	31026.0

IRON—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3219·93	2	3219·92 K. & R.	0·90	8·8	31047·8
3219·67	2	3219·67 "	"	"	31050·3
3217·47	2	3217·49 "	"	"	31071·5
3216·04	2	3216·03 "	"	8·9	31085·2
3214·49	1	3214·48 "	"	"	31100·2
3214·13	3	3214·14 "	"	"	31103·7
3213·45	5	3213·43 "	"	"	31110·3
3212·13	3	3212·08 "	"	"	31123·1
3211·82	1	3211·77 "	"	"	31125·5
3210·94	1	3210·92 "	"	"	31134·6
3210·56	3	3210·35 "	"	"	31138·3
3210·35	1	3210·35 "	"	"	31140·4
3209·45	1	3209·45 "	"	"	31149·1
3208·6	1n	3208·60 "	"	"	31157
3205·50	2	3205·45 "	"	"	31187·5
3202·75	1	3202·65 "	"	"	31222·8
3200·58	2	3200·58 "	"	"	31235·4
3199·63	1	3199·62 "	"	"	31244·7
3197·06	3	3197·04 "	"	"	31268·9
3196·21	3	3196·24 "	"	"	31278·1
3193·95	3	3193·92 "	"	"	31300·3
3193·39	2	3193·37 "	"	"	31305·7
3193·05	2	3192·93 "	"	"	31309·1
3192·15	1n		"	"	31317·9
3191·77	1	3191·77 "	"	"	31321·7
3190·95	1n	3190·80 "	"	"	31329·7
3188·92	1	3188·96 "	"	"	31349·7
3188·70	1n	3188·67 "	"	"	31351·8
3187·40	1	3187·35 "	"	"	31364·6
3186·87	3	3186·83 "	"	"	31369·9
3185·43	1n	3185·34 "	"	"	31384·0
3184·98	1	3185·00 "	"	"	31388·5
3183·24	1	3183·11 "	"	"	31405·6
3181·67	1	3181·60 "	0·89	"	31421·1
3180·85	1n	3180·85 "	"	9·0	31429·1
3180·32	2	3180·30 "	"	"	31434·4
3179·61	2	3179·61 "	"	"	31441·4
3179·07	1	3179·06 "	"	"	31446·7
3178·09	1	3178·08 "	"	"	31456·4
3177·64	3	3177·64 "	"	"	31460·9
3175·54	1	3175·53 "	"	"	31481·7
3171·43	1	3171·44 "	"	"	31522·5
3170·47	1	3170·43 "	"	"	31532·1
3167·96	4	3167·97 "	"	"	31557·1
3166·52	1	3166·55 "	"	"	31571·4
3165·95	1n	3165·97 "	"	"	31577·1
3162·90	1		"	"	31607·6
3162·05	1	3162·04 "	"	"	31616·1
3160·74	1	3160·74 "	"	"	31629·2
3159·0	1b	3159·08 "	"	"	31647
3157·97	1n	3157·99 "	"	"	31656·9
3157·12	1	3157·15 "	"	"	31665·4
(3154·32)	5	3154·29 "	"	"	31693·6
3153·33	1n	3153·31 "	"	"	31703·5
3151·45	1	3151·42 "	"	"	31722·4

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuum
			$\lambda +$	$\frac{1}{\lambda} -$	
3144·88	1	3144·61 K. & R.	0·89	9·1	31788·6
3144·08	1	3144·06 "	"	"	31796·7
3142·95	1	3142·97 "	"	"	31808·1
3142·52	1n	3142·54 "	"	"	31812·5
3140·48	1n	3140·47 "	0·88	"	31833·2
3140·00	1n	3140·00 "	"	"	31838·0
3135·49	2	3135·51 "	"	"	31883·8
3134·20	1	3134·21 "	"	"	31897·0
3133·17	1n	"	"	"	31907·5
3126·25	1n	3126·25 "	"	"	31978·1
3125·77	1	3125·77 "	"	"	31983·0
3120·50	1	3120·54 "	"	"	32037·0
3119·60	1	3119·58 "	"	"	32046·3
3116·70	1	3116·73 "	"	"	32076·1
3114·40	1	"	"	9·2	32099·7
3106·65	1n	3106·59 "	"	"	32079·8
3105·65	1n	3105·69 "	"	"	32090·2
3105·25	1n	"	"	"	32194·3
3100·76	2	3100·77 "	0·87	"	32241·0
3100·44	2	"	"	"	32244·3
3100·05	2	3100·04 "	"	"	32248·3
3098·30	1	3098·25 "	"	"	32266·6
3096·45	1	"	"	"	32285·8
3091·70	2	3091·67 "	"	"	32335·5
3089·5	1n	3089·64 "	"	"	32359
3083·85	2	3083·81 "	"	9·3	32417·7
3078·9	1b	"	"	"	32470
3077·30	2	3077·32 "	"	"	32486·7
3075·84	2	3075·80 "	"	"	32502·1
3068·27	1n	3068·25 "	"	"	32582·4
3067·35	3	3067·30 "	"	"	32592·1
3065·50	1n	3065·40 "	"	"	22611·8
3062·33	2	{ 3062·47 } 3062·29 "	0·86	"	32645·6
3059·20	3	3059·19 "	"	"	32679·0
3057·56	3	3057·55 "	"	"	32696·5
3056·95	1n	"	"	"	32703·0
3055·40	1	3055·35 "	"	"	32719·6
3053·17	1	3053·15 "	"	"	32743·4
(3047·72)	3	3047·71 "	"	9·4	32802·0
3045·1	1b	3045·16 "	"	"	32830
3042·77	1	3042·75 "	"	"	32855·4
3042·12	1	3042·13 "	"	"	32862·5
3041·88	1	3041·83 "	"	"	32865·0
3041·80	1	"	"	"	32865·9
3040·55	1	3040·54 "	"	"	32879·4
3037·50	3	3037·54 "	"	"	32912·4
3031·75	1	3031·74 "	"	"	32974·9
3031·34	1	3031·31 "	"	"	32979·3
3030·25	1	3030·24 "	"	"	32991·2
3026·57	1	3026·57 "	"	"	33031·3
3025·96	2	3026·00 "	"	"	33038·0
3025·75	1	3025·75 "	"	"	33040·3
3024·14	1	3024·13 "	"	9·5	33057·7
3021·18	2	3021·15 "	0·85	"	33090·1



## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3020.79	2	3020.70 K. & R.	0.85	9.5	33094.4
3020.60	2		"	"	33096.5
3019.11	1	3019.08 "	"	"	33112.8
3017.73	1	3017.72 "	"	"	33128.0
3016.30	1	3016.29 "	"	"	33143.7
3016.05	1n	3016.04 "	"	"	33146.4
3011.60	1	3011.57 "	"	"	33195.4
3009.70	2	3009.66 "	"	"	33216.4
3008.26	2	3008.23 "	"	"	33232.3
3007.42	1	3007.30 "	"	"	33241.6
3003.19	1	3003.14 "	"	"	33288.4
3002.80	3	3002.74 "	"	"	33292.8
3001.08	2	3001.05 "	"	"	33311.8
3000.57	1	3000.56 "	"	"	33317.5
3000.20	1n		"	"	33321.6
2999.65	2	2999.61 "	"	"	33327.7
2997.45	1	2997.51 "	"	9.6	33352.1
2994.56	3	2994.54 "	"	"	33384.3
2990.51	1	2990.48 "	"	"	33429.5
2987.41	1	2987.40 "	"	"	33464.2
2985.70	4	2985.65 "	"	"	33483.4
2984.97	6	2984.92 "	"	"	33491.6
2983.71	2	2983.68 "	"	"	33504.7
2982.20	1	2982.31 "	0.84	"	33522.7
2981.59	1	2981.54 "	"	"	33529.5
2981.12	1n		"	"	33534.8
2980.70	1n	2980.62 "	"	"	33539.6
2979.48	1	2979.44 "	"	"	33553.3
2976.70	1	2976.66 "	"	"	33584.6
2976.05	1		"	"	33592.0
2973.39	2	2973.41 "	"	"	33622.0
2973.28	2	2973.17 "	"	"	33623.3
2970.64	2	2970.60 "	"	9.7	33653.1
2970.25	2	2970.20 "	"	"	33657.5
2970.05	1		"	"	33659.8
2969.63	1		"	"	33664.5
2969.53	1	2969.52 "	"	"	33665.7
2967.03	2	2966.99 "	"	"	33694.0
2965.39	1	2965.35 "	"	"	33712.7
2965.17	2	2965.12 "	"	"	33715.2
2964.76	1	2964.72 "	"	"	33719.8
2964.25	1	2964.30 "	"	"	33725.6
2961.40	1	2961.30 "	"	"	33758.1
2960.11	1	2960.07 "	"	"	33772.8
2959.70	1	2959.76 "	"	"	33777.5
(2957.49)	1	2957.48 "	"	"	33802.8
2954.06	2	2953.99 "	"	"	33842.0
2953.88	3	2953.86 "	"	"	33844.1
2950.35	1n	2950.34 "	"	"	33884.6
2949.30	2	2949.28 "	"	"	33896.7
2948.52	1	2948.52 "	"	"	33905.6
2948.00	2	2948.00 "	"	"	33911.6
2947.78	3	2947.77 "	"	"	33914.1
2944.55	4	2944.49 "	"	9.8	33951.2
2941.46	1	2941.42 "	0.83	"	33986.9

IRON—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2939·62	1		0·83	9·8	34008·2
(2937·02)	2	2936·99 K. & R.	"	"	34038·3
2931·75	1n		"	"	34099·5
2929·13	2	2929·20	"	"	34130·0
2926·71	3	2926·65	"	"	34158·3
2925·52	1	2925·43	"	"	34172·2
2923·99	1	2923·94	"	"	34190·0
2923·43	1	2923·39	"	"	34196·6
2922·16	1		"	"	34211·5
2920·82	1	2920·76	"	9·9	34227·1
2918·14	1	2918·11	"	"	34258·5
2917·65	1n	2917·58	"	"	34264·3
2917·20	1n		"	"	34269·6
2912·27	1	2912·26	"	"	34327·6
2910·9	1b		"	"	34344
2907·98	1	2907·94	"	"	34378·2
2907·60	1	2907·59	"	"	34382·7
2906·25	1	2906·23	"	"	34398·7
2902·57	1n	2902·55	0·82	"	34442·3
2902·03	1n	2902·02	"	"	34448·7
2901·52	1	2901·46	"	"	34454·8
2899·50	1	2899·49	"	"	34478·8
2897·37	2	2897·69	"	"	34504·2
2895·35	2		"	10·0	34528·1
2895·17	1	2895·11	"	"	34530·3
2894·90	2		"	"	34533·5
2894·65	1	2894·59	"	"	34536·5
2892·95	1	2892·89	"	"	34556·8
2888·20	1		"	"	34613·6
2887·95	1	2887·88	"	"	34616·6
2887·4	1n	2887·43	"	"	34623
2886·32	1	2886·38	"	"	34636·2
2886·02	1		"	"	34639·8
2884·9	1b		"	"	34653
2883·80	3	2883·80	"	"	34666·5
2880·89	3	2880·84	"	"	34701·5
2879·35	1		"	"	34720·1
2877·38	1	2877·37	"	"	34743·8
2876·86	2	2876·80	"	"	34750·1
2875·44	2	2875·35	"	"	34767·3
2874·27	1	2874·24	"	"	34781·4
2873·49	4	2873·48	"	"	34790·9
2872·47	3	2872·38	"	10·1	34803·1
2871·19	2	2871·16	"	"	34818·7
2870·70	1		"	"	34824·6
2869·40	1	2869·38	"	"	34840·4
2869·28	1		"	"	34841·9
2868·96	1	2868·94	"	"	34845·7
2868·52	1	2868·50	"	"	34851·1
2866·82	1	2866·68	"	"	34871·8
2865·05	1		"	"	34893·3
2864·4	1b		0·81	"	34901
2863·95	1	2863·92	"	"	34906·7
2863·53	1	2863·46	"	"	34911·8
2861·26	1	2861·29	"	"	34939·5

1898,

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## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
2858·95	ln	2858·96 K. & R.	0·81	10·1	34967·8
2858·40	5	2858·41 "	"	"	34974·5
2857·53	1	"	"	"	34985·2
2857·28	2	2857·29 "	"	"	34988·2
2857·07	ln	2857·09 "	"	"	34990·8
2856·52	ln	"	"	"	34997·5
2856·25	1	2856·19 "	"	"	35000·8
2855·77	3	2855·75 "	"	"	35006·7
2853·85	ln	2853·81 "	"	"	35030·3
2853·33	ln	"	"	"	35036·7
2853·02	ln	2853·02 "	"	"	35040·5
2852·24	1 Mg	2852·19 "	"	"	35050·1
(2851·90)	2	2851·85 "	"	"	35054·2
2849·70	2	2849·67 "	"	"	35081·3
2849·02	1	"	"	"	35089·7
2848·52	2b	2848·77 "	"	"	35095·9
2848·15	2	2848·13 "	"	10·2	35100·3
2847·34	1	"	"	"	35110·3
2845·8	2b	2845·75 "	"	"	35129
2845·72	1	"	"	"	35130·3
2845·51	ln	"	"	"	35132·9
2844·08	2	2844·04 "	"	"	35150·6
2843·75	1	"	"	"	35154·7
2843·58	1	2843·69 "	"	"	35156·7
2843·43	ln	2843·30 "	"	"	35158·6
2842·85	ln	2842·96 "	"	"	35165·8
2842·20	1	2842·46 "	"	"	35173·8
2841·47	1	2841·32 "	"	"	35182·9
2840·82	3	2840·73 "	"	"	35190·9
2840·46	2	2840·50 "	"	"	35195·4
2839·85	2b	2839·66 "	"	"	35202·9
(2838·23)	1	2838·19 "	"	"	35223·0
2837·43	1	"	"	"	35233·0
2836·63	1	"	"	"	35242·9
2836·31	1	2836·45 "	"	"	35246·9
2835·82	4	2835·76 "	"	"	35253·0
2835·58	1	2835·51 "	"	"	35256·0
2833·3	1b	"	"	"	35284
2832·57	2	2832·47 "	"	"	35293·4
2831·67	5	"	"	"	35304·6
2831·15	1	2831·04 "	"	"	35311·1
2828·75	3	2828·87 "	"	"	35341·1
2828·02	1	2827·98 "	"	"	35350·2
2827·55	2	2827·68 "	"	"	35356·1
2826·16	1	2826·07 "	"	"	35373·5
2825·85	1	2825·75 "	"	"	35377·4
2825·66	2	2825·60 "	0·80	"	35379·8
2823·41	3	2823·32 "	"	10·3	35407·9
2819·45	1	2819·35 "	"	"	35457·6
2817·60	ln	2817·55 "	"	"	35480·9
2817·25	ln	"	"	"	35485·3
2813·74	1	2813·67 "	"	"	35529·6
2813·40	2	2813·36 "	"	"	35533·9
2812·2	ln	2812·36 "	"	"	35549
2811·36	1	2811·23 "	"	"	35559·7



## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
2810·0	1b		0·80	10·3	35577
2807·10	2	2807·03 K. & R.	"	"	35613·7
2805·91	1	2805·87 "	"	"	35628·8
2805·44	1n	"	"	"	35634·7
2805·02	1	"	"	"	35640·1
2804·64	2	2804·56 "	"	"	35644·9
2804·13	1n	2804·13 "	"	"	35651·4
2803·72	1n	2803·68 "	"	"	35656·6
2802·82	2 Mg?	2802·76 "	"	"	35668·1
2801·18	1n Mn	2801·15 "	"	"	35688·9
2800·9	1n	2800·73 "	"	"	35693
2799·83	1	2799·87 "	"	"	35706·2
2799·42	2	2799·34 "	"	10·4	35710·9
2798·40	1 Mn	2798·31 "	"	"	35724·3
2798·06	1	"	"	"	35728·6
2797·92	1	2797·82 "	"	"	35730·4
2797·5	1b	"	"	"	35736
2796·9	1b	2796·91 "	"	"	35744
2795·65	3 Mg	2795·58 "	"	"	35759·5
2794·9	1n	2795·00 "	"	"	35769
2794·02	3	2793·97 "	"	"	35780·3
2793·40	1	"	"	"	35788·3
2792·55	1	2792·44 "	"	"	35799·2
2791·94	1	2791·84 "	"	"	35807·0
2791·65	1	2791·51 "	"	"	35810·7
2791·20	1	"	"	"	35816·5
2790·70	1	"	"	"	35812·9
2789·87	1	2789·87 "	"	"	35833·6
2788·23	3n	2788·19 "	"	"	35854·6
2787·5	1b	"	"	"	35864·0
2785·46	3n	2785·25 "	"	"	35890·3
2784·43	1	2784·40 "	"	"	35903·0
2783·81	7	2783·75 "	"	"	35911·5
2781·96	1	2781·89 "	"	"	35935·5
2780·9	1b	2780·93 "	"	"	35949·2
2780·19	1	2780·28 "	"	"	35958·5
2780·07	1	"	"	"	35959·9
2779·40	5	2779·34 "	"	"	35968·6
2778·96	1	2778·89 "	"	"	35974·3
2778·34	2	2778·29 "	"	"	35982·3
2778·01	2	2778·15 "	"	"	35986·6
2777·15	1b	"	"	"	35997·7
2776·31	1	2776·47 "	"	"	36008·6
2775·5	1n	"	"	10·5	36019·0
2774·82	3	2774·76 "	"	"	36027·9
2773·38	1	2773·28 "	"	"	36043·6
2772·6	1n	2772·56 "	"	"	36056·7
2772·23	2	2772·15 "	"	"	36061·5
2771·70	1	"	"	"	36068·4
2771·34	1	2771·30 "	"	"	36073·1
2770·64	2	2770·75 "	"	"	36081·2
2769·49	4	2769·37 "	"	"	36097·2
2769·03	3	2768·98 "	"	"	36103·2
2768·50	1	2768·52 "	"	"	36110·1
2767·62	7r	2767·56 "	"	"	36121·6

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2767.06	1	2766.99 K. & R.	0.80	10.5	36128.9
2766.3	1b	2766.45 "	"	"	36138.9
2765.6	1b	2765.73 "	"	"	36148.0
2764.93	1	2764.80 "	"	"	36156.8
2764.50	1	2764.41 "	"	"	36162.3
2764.05	1	"	"	"	36168.3
2763.25	1	2763.17 "	"	"	36178.7
2762.60	1	2762.82 "	"	"	36187.3
2762.19	2	2762.12 "	"	"	36192.7
2761.88	3	2761.83 "	"	"	36196.7
2761.00	1	2760.96 "	"	"	36221.4
2759.95	1	2759.86 "	"	"	36222.0
2759.45	1n	2759.42 "	"	"	36228.6
2758.60	1n	"	"	"	36239.8
2758.02	1n	2757.91 "	"	"	36247.4
2757.45	2	"	"	"	36254.9
2757.16	2	2757.09 "	"	"	36258.7
2756.65	1	2756.85 "	"	"	36265.4
2756.45	2	"	"	"	36268.0
2755.82	10	2755.77 "	"	"	36276.5
2754.55	1	2754.48 "	"	"	36294.1
2754.19	1	2754.09 "	"	"	36298.0
2753.83	1	2753.74 "	"	"	36302.6
2753.32	7	2753.37 "	"	"	36309.3
2752.3	1b	2752.20 "	"	"	36322.8
2751.26	2	2751.20 "	"	10.6	36336.4
(2750.24)	1	2750.21 "	"	"	36349.9
2749.40	10	2749.42 "	"	"	36361.0
2747.08	7	2747.03 "	"	"	36391.4
2746.58	7	2746.54 "	"	"	36398.3
2744.98	1	2745.13 "	"	"	36419.5
2744.60	1	2744.60 "	"	"	36424.6
2744.15	1	2744.12 "	"	"	36430.6
2743.34	8	2743.23 "	"	"	36441.4
2742.51	2	2742.45 "	"	"	36452.4
2742.36	1	"	"	"	36454.4
2741.46	2	2741.48 "	"	"	36466.3
2739.67	10	2739.59 "	"	"	36490.1
2737.74	1	2737.72 "	"	"	36515.9
2737.43	2	2737.37 "	"	"	36520.0
2737.05	5	2737.02 "	"	"	36525.1
2735.57	2	2735.61 "	"	"	36544.9
2734.92	1	2734.98 "	"	"	36553.5
2734.38	1	2734.39 "	"	"	36560.7
2734.12	1	2734.07 "	"	"	36564.2
2733.69	2	2733.65 "	"	"	36570.0
2733.06	1	"	"	"	36578.4
2732.59	1	2732.53 "	"	"	36584.7
2732.15	1	2731.93 "	"	"	36590.6
2730.85	4	2730.79 "	"	"	"
2729.70	1n	"	"	"	36623.5
2728.99	2	2728.90 "	"	"	36633.0
2728.10	1	2728.11 "	"	"	36644.9
2727.59	8	2727.61 "	"	10.7	36651.7
2726.62	1	"	"	"	36664.7

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
2726·34	1		0·80	10·7	36668·5
2726·15	1	2726·20 K. & R.	"	"	36672·3
2724·99	4	2724·97 "	"	"	36686·7
2723·69	2	2723·66 "	"	"	36704·2
2722·86	2		"	"	36715·4
2722·18	2	2722·10 "	"	"	36714·5
2721·94	1		"	"	36727·8
2721·00	3	2720·99 "	"	"	36740·5
2720·30	1	2720·28 "	"	"	36749·9
2719·40	2	2719·51 "	"	"	36762·1
2719·13	2	2719·11 "	"	"	36765·7
2718·73	1		"	"	36771·2
2718·54	1	2718·51 "	"	"	36773·6
2718·2	1b		"	"	36778·3
2716·77	1n		"	"	36897·7
2716·30	4	2716·31 "	"	"	36804·1
2714·51	7	2714·48 "	"	"	36828·3
2712·48	2	2712·42 "	"	"	36855·9
2711·94	4	2711·92 "	"	"	36863·3
2710·66	1	2710·61 "	"	"	36880·7
2710·0	1b	2710·08 "	"	"	36989·7
2709·51	1	2709·47 "	"	"	36996·3
2709·14	3	2709·13 "	"	"	36901·4
2708·69	1	2708·64 "	"	"	36907·5
2707·23	3	2707·13 "	"	"	36926·8
(2706·68)	3	2706·63 "	"	"	36934·9
2706·14	1	2706·07 "	"	"	36942·3
2704·66	1	2704·80 "	"	"	36962·5
2704·10	5	2704·06 "	"	"	36970·1
2701·8	1b	2701·99 "	"	"	37001·7
2701·4	1b		"	"	37007·1
*2699·22	1	2699·18 "	"	"	37037·0
*2697·52	2	2697·58 "	"	"	37060·4
2696·35	1	2696·41 "	"	"	37076·5
2696·1	1n	2696·12 "	"	"	37079·9
2695·4	1b	2695·64 "	"	10·8	37089·4
2694·5	1b	2694·63 "	"	"	37101·8
2693·96	1		"	"	37109·3
2692·92	2	2692·91 "	"	"	37123·6
2692·68	6	2692·71 "	"	"	37126·9
2691·83	1	2691·80 "	"	"	37138·6
2690·17	1	2690·17 "	"	"	37161·6
2689·93	1	2689·92 "	"	"	37165·2
2689·26	3	2689·28 "	"	"	37174·1
2686·5	1n		"	"	37212·4
2686·2	1n		"	"	37216·5
2684·84	6	2684·86 "	"	"	37235·3
2683·10	1		"	"	37259·5
2682·63	2		"	"	37266·1
2681·16	1n		"	"	37286·5
2680·98	1n	2680·99 "	"	"	37289·0
2680·77	1n		"	"	37292·0
2680·55	1n	2680·53 "	"	"	37295·0
(2679·15)	2	2679·14 "	"	"	37314·0
2677·00	1	2676·97 "	"	10·9	37444·3

\* Double.



## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
2672.7	1n		0.80	10.9	37404.5
2672.3	1n	2672.30 K. & R.	"	"	37410.0
2671.6	1n	2671.49 "	"	"	37419.9
2670.52	1	2670.59 "	"	"	37434.8
2670.05	1	2670.00 "	"	"	37441.6
2669.60	1	2669.55 "	"	"	37447.9
2669.3	1b		"	"	37452.1
2667.45	1n	2667.36 "	"	"	37478.1
2666.75	7	2666.72 "	"	"	37487.9
2665.77	1n	2665.87 "	"	"	37501.7
2664.78	7	2664.74 "	"	"	37515.6
2664.34	2		"	"	37521.8
2662.8	1n		"	"	37543.6
2662.13	1n	2662.13 "	"	"	37557.0
2660.50	1b	2660.48 "	"	"	37576.0
2658.38	3	2658.48 "	"	"	37606.0
2658.05	1		"	"	37610.6
2656.26	1n	2656.22 "	"	"	37636.0
2656.0	1b		"	"	37639.7
2654.8	1b		"	11.0	37656.6
2653.8	1b	2653.87 "	"	"	37670.8
2652.68	1	2652.53 "	"	"	37686.7
2651.82	1	2651.78 "	"	"	37798.9
2650.70	2b		"	"	37714.9
2649.59	3		"	"	37730.7
2647.70	1n	2647.64 "	"	"	37757.6
2646.36	1	2646.40 "	"	"	37772.5
2645.49	2	2645.52 "	"	"	37889.2
2645.26	2		"	"	37892.4
2644.12	2	2644.07 "	"	"	37808.8
2642.13	3		"	"	37837.2
2641.77	1n	2641.74 "	"	"	37842.4
2641.23	1n	2641.13 "	"	"	37850.1
2639.66	3	2639.60 "	"	"	37872.7
2637.72	4	2637.69 "	"	"	37800.5
2636.82	1n		"	"	37813.5
2636.68	1n	2636.54 "	"	"	37815.5
2635.91	2	2635.87 "	"	"	37826.6
2635.50	2		"	"	37932.4
2635.07	1n	2635.00 "	"	"	37938.6
2634.00	1		"	"	37954.0
2633.75	1	2633.68 "	"	"	37957.8
2633.31	2		"	"	37964.0
2632.70	1	2632.66 "	"	"	37972.8
2632.35	1	2632.30 "	"	"	37977.8
2631.79	3	2631.72 "	"	11.1	37985.0
2631.46	4	2631.37 "	"	"	38090.6
2631.14	4	2631.07 "	"	"	38095.2
2630.16	3	2630.13 "	"	"	38009.4
2629.67	5	2629.66 "	"	"	38016.5
2628.40	8	2628.35 "	"	"	38034.9
2626.60	3	2626.52 "	"	"	38060.9
2625.80	7	} 2625.72 "	"	"	38072.5
2625.67	5		"	"	38074.4
2624.35	1	2624.21 "	"	"	38093.6

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2623·88	2		0·80	11·1	38100·4
2623·65	2	2623·58 K. & R.	"	"	38103·3
2623·26	2		"	"	38110·4
2621·78	6	2621·72 "	"	"	38130·9
2620·81	3	2620·73 "	"	"	38145·0
2620·54	3	2620·47 "	"	"	38148·2
2620·27	2n		"	"	38152·9
2619·16	4	2619·06 "	"	"	38169·1
2618·16	1	2618·10 "	"	"	38183·7
2617·70	7	2617·70 "	"	"	38190·4
2616·49	1	2616·50 "	"	"	38208·0
2615·50	1	2615·50 "	"	"	38222·5
2615·00	1		"	"	38229·8
2614·60	1n	2614·62 "	"	"	38235·7
2613·91	9	2613·91 "	"	"	38245·8
2611·95	9	2611·94 "	"	"	38274·5
2611·16	3	2611·16 "	"	"	38286·0
2609·96	2	2609·79 "	"	"	38303·7
2609·57	1		"	"	38309·4
2609·20	2	2609·30 "	"	11·2	38314·7
2608·92	1	2608·65 "	"	"	38318·8
2607·17	9b <sup>v</sup>	2607·16 "	"	"	38344·6
2606·60	4	2606·92 "	"	"	38357·0
2606·03	1		"	"	38361·5
2605·44	5	2605·77 "	"	"	38370·0
2605·10	4		"	"	38375·2
2604·80	1n	2604·90 "	"	"	38379·5
2604·52	1		"	"	38383·5
2604·13	1		"	"	38393·9
2602·08	1n		"	"	38419·7
2601·25	1		"	"	38421·8
2600·55	1	2600·25 "	"	"	38442·2
2599·50	10r	2599·53 "	"	"	38457·7
2598·43	9	2598·44 "	"	"	38473·5
2596·87	1n	2596·60 "	"	"	38496·7
2595·75	1n		"	"	38413·6
2595·37	1	2595·41 "	"	"	38419·6
2595·06	1		"	"	38425·4
2594·17	1n	2594·20 "	"	"	38437·4
2593·80	4	2593·75 "	"	"	38442·5
2592·87	6	2592·90 "	"	"	38456·2
2591·65	6	2591·65 "	"	"	38474·6
2590·65	3	2590·65 "	"	"	38489·5
2588·87	2	2588·96 "	"	"	38415·8
2588·05	5b <sup>v</sup>	2588·11 "	"	"	38627·9
2585·96	8b <sup>v</sup>	2585·93 "	"	11·3	38659·1
(2584·63)		2584·59 "	"	"	38678·9
2583·43	1		"	"	38796·9
2583·15	1		"	"	38701·1
2582·62	7	2582·50 "	"	"	38705·6
2581·22	2		"	"	38730·1
2580·82	1		"	"	38736·1
2580·6	1	2580·52 "	"	"	38739·4
2579·48	2n		"	"	38756·2
2579·22	2n	2579·35 "	"	"	38760·1

IRON—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2577·98	5		0·80	11·3	38778·8
2577·50	1	2577·41 K. & R.	"	"	38786·0
2576·89	5	2576·76	"	"	38895·2
2576·18	1 Mn	2576·20	"	"	38805·9
2575·83	1	2575·83	"	"	38811·1
2574·46	5	2574·43	"	"	38831·8
2573·85	1	2573·84	"	"	38841·0
2573·32	2	2573·23	"	"	38849·0
2573·06	2		"	"	38852·9
2572·3	1b		"	"	38864·4
2571·65	1	2571·67	"	"	38874·2
2570·94	4	2570·92	"	"	38885·0
2570·14	2		"	"	38997·1
2569·86	3	2569·73	"	"	38901·3
2568·96	2	2568·97	"	"	38915·0
2568·48	4	2568·49	"	11·4	38922·2
2567·01	4	2566·99	"	"	38944·4
2566·71	2		"	"	38949·0
2566·49	2		"	"	38952·3
2566·31	3		"	"	38955·0
2565·1	1n		"	"	38973·4
2563·95	2	2563·99	"	"	38990·9
2563·54	5	2563·53	"	"	38997·2
2562·59	6	2562·63	"	"	39011·6
2562·16	3	2562·35	"	"	39015·1
2561·70	1n	2561·87	"	"	39025·2
2561·02	1		"	"	39035·5
2560·39	4	2560·43	"	"	39045·2
2560·01	3		"	"	39051·0
2559·84	3	2559·91	"	"	39053·5
2559·35	2	2559·25	"	"	39061·0
2558·70	1	2558·60	"	"	39070·9
2557·60	3	2557·42	"	"	39087·8
2557·18	1	2556·92	"	"	39094·1
2556·40	1	2556·38	"	"	39106·1
2555·54	3	2555·59	"	"	39119·3
2555·12	3	2555·37	"	"	39125·7
2554·52	1	2555·04	"	"	39134·9
2553·85	2		"	"	39145·2
2553·30	2	2553·32	"	"	39153·6
2552·93	1		"	"	39159·3
2552·68	1	2552·74	"	"	39163·1
2552·06	1n		"	"	39171·6
2551·32	4	2551·19	"	"	39184·0
2550·87	5	2550·75	"	"	39190·9
2550·20	5	2550·07	"	"	39201·2
2549·60	4	2549·63	"	"	39210·4
2549·20	3		"	11·5	39216·6
2548·89	3		"	"	39221·3
2548·73	3	2548·76	"	"	39223·7
2548·42	3	2548·17	"	"	39228·5
2547·43	4	2547·06	"	"	39243·7
2546·80	5	2546·26	"	"	39253·5
2546·06	2	2545·95	"	"	39263·9
2545·60	2n		"	"	39270·4



## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2545·32	3		0·80	11·5	39276·3
2545·05	3 Cu				39279·4
2544·82	1	2544·83 K. & R.	"	"	39284·0
2544·02	3	2544·02 "	"	"	39296·3
2543·49	5	2543·47 "	"	"	39304·6
2542·24	3	2542·20 "	"	"	39323·9
2541·91	5		"	"	39329·0
2541·20	5	2541·18 "	"	"	39340·0
2540·72	5	2540·90 "	"	"	39347·4
2539·91	1	2540·00 "	"	"	39360·0
2539·10	4		"	"	39372·5
2538·95	5	2538·98 "	"	"	39374·9
2538·65	2		"	"	39379·5
2538·25	4		"	"	39385·7
2537·3	3b	2537·21 "	"	"	39400·5
2536·95	5	2536·90 "	"	"	39405·9
2536·84	3		"	"	39407·5
2535·59	5	2535·67 "	"	"	39427·1
2534·50	6	2534·52 "	"	"	39444·0
2533·71	7	2533·86 "	"	"	39456·3
2532·2	1b	2532·37 "	"	"	39479·8
2531·16	1		"	"	39501·6
2530·77	2	2530·79 "	"	"	39502·1
2530·18	4	2530·03 "	"	11·6	39511·2
2529·59	6	2529·65 "	"	"	39520·6
2529·36	2n	2529·40 "	"	"	39524·1
2529·24	2n	2529·03 "	"	"	39526·0
2528·58	1	2528·57 "	"	"	39536·3
2527·80	3	2527·67 "	"	"	39548·5
2527·51	3	2527·30 "	"	"	39553·0
2527·16	3		"	"	39558·5
2526·40	6	2526·30 "	"	"	39570·4
2526·16	2		"	"	39574·2
2525·95	1		"	"	39577·5
2525·50	7	2525·48 "	"	"	39584·5
2525·22	3n	2525·11 "	"	"	39588·9
2524·41	3	2524·52 "	"	"	39601·3
2523·76	3	2523·76 "	"	"	39611·8
2522·96	6	2522·93 "	"	"	39624·4
2522·31	2	2522·67 "	"	"	39634·6
2521·93	4	2521·97 "	"	"	39640·6
2521·60	2		"	"	39644·2
2521·22	5	2521·09 "	"	"	39651·8
2520·76	2		"	"	39659·0
2520·45	1n		"	"	39663·9
2519·70	2	2519·71 "	"	"	39675·7
2519·49	1	2519·30 "	"	"	39679·0
2519·14	5	2518·93 "	"	"	39684·5
2518·19	4	2518·25 "	"	"	39699·4
2517·75	1	2517·76 "	"	"	39706·5
2517·21	5	2517·21 "	"	"	39714·9
2516·68	1	2516·65 "	"	"	39723·4
2516·19	2	2516·19 "	"	"	39731·0
2515·21	2		"	"	39746·5
2514·95	2	2514·84 "	"	"	39750·6

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
2514.49	6	2514.38 K. & R.	0.80	11.6	39757.9
2513.40	2n	2513.33   "	"	"	39775.1
2512.60	3	2512.38   "	"	"	39787.8
2511.85	7	2511.84   "	"	11.7	39799.6
2511.46	1	2511.41   "	"	"	39805.8
(2510.93)	3	{ 2511.05 } 2510.87   "	"	"	39814.2
2510.00	1n		"	"	39828.9
2509.18	3	2509.43   "	"	"	39811.9
2508.82	1	2508.78   "	"	"	39847.7
2508.40	2		"	"	39854.3
2507.98	2	2507.99   "	"	"	39861.0
2507.73	1n		"	"	39863.9
2507.11	1		"	"	39874.8
2506.95	1n	2506.98   "	"	"	39877.4
2506.53	1 Cu		"	"	39883.9
2506.15	4	2506.25   "	"	"	39890.1
2505.30	2		"	"	39903.7
2505.05	1n	2505.09   "	"	"	39907.6
2503.97	5	2503.89   "	"	"	39924.9
2503.67	3	2503.89   "	"	"	39929.7
2503.39	4	2503.50   "	"	"	39934.1
2502.49	4	2502.53   "	"	"	39948.5
2501.79	1	2501.87   "	"	"	39979.7
2501.55	1		"	"	39963.5
2501.25	2		"	"	39968.3
2501.00	3	2501.00   "	"	"	39972.3
2500.47	1n		"	"	39979.8
2499.98	1		"	"	40088.6
2498.95	7b <sup>v</sup>	2498.96   "	"	"	40005.1
2498.46	1	2498.37   "	"	"	40013.0
2497.88	5	2497.88   "	"	"	40022.3
2497.36	1		"	"	40030.6
2497.07	1	2497.15   "	"	"	40035.3
2496.61	2	2496.60   "	"	"	40042.6
2495.91	3	2496.01   "	"	"	40053.8
2494.12	2n	2494.10   "	"	11.8	40082.5
2493.31	8	2493.34   "	"	"	40095.5
2492.41	3	2492.72   "	"	"	40110.0
2492.05	1	2492.12   "	"	"	40115.8
2491.47	4	2491.50   "	"	"	40125.1
2491.22	2		"	"	40129.2
2490.91	3	2490.98   "	"	"	40134.2
2490.75	3	2490.50   "	"	"	40136.7
2489.92	5	2490.01   "	"	"	40150.1
2489.52	3	2489.63   "	"	"	40156.5
2489.00	1	2489.04   "	"	"	40164.9
2488.40	1n		"	"	40174.6
2488.23	2n	2488.23   "	"	"	40177.3
2487.43	1	2487.44   "	"	"	40190.3
2487.12	1	2487.18   "	"	"	40195.3
2486.76	1	2486.77   "	"	"	40201.2
2486.39	5	2486.42   "	"	"	40207.1
2485.15	1	2485.21   "	"	"	40227.2
2484.63	2		"	"	40235.6

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2484·30	3	2484·35 K. & R.	0·80	11·8	40241·0
2483·83	2		"	"	40248·6
2483·33	4n	2483·34 "	"	"	40256·7
2482·78	4		"	"	40265·6
2482·38	2		"	"	40272·1
2482·18	4	2482·16 "	"	"	40265·4
2481·66	2		"	"	40283·8
2481·11	3	2481·11 "	"	"	40292·7
2480·22	5	2480·25 "	"	"	40307·2
2479·83	3	2479·64 "	"	"	40313·6
2479·53	1		"	"	40318·4
2479·29	1		"	"	40312·4
2478·62	4	2478·67 "	"	"	40333·1
2478·20	2	2478·22 "	"	"	40340·1
2477·40	3	2477·41 "	"	"	40353·1
2476·74	2	2476·77 "	"	11·9	40363·8
2476·31	2	2476·40 "	"	"	40370·8
2475·70	2n		"	"	40380·7
2475·25	1n		"	"	40388·0
2474·82	3	2474·88 "	"	"	40395·1
2473·41	3	2473·30 "	"	"	40418·1
2473·00	2n	2473·15 "	"	"	40424·8
2472·65	1n		"	"	40430·0
2472·45	3	2472·40 "	"	"	40433·8
2472·14	2		"	"	40437·7
2471·72	1		"	"	40445·8
2471·40	1		"	"	40451·0
2470·73	4	2470·78 "	"	"	40462·1
2470·44	3		"	"	40466·7
2469·92	1	2470·01 "	"	"	40475·2
2469·53	4	2469·53 "	"	"	40481·6
2468·95	2	2468·97 "	"	"	40491·2
2468·67	1		"	"	40495·7
2468·34	3	2468·41 "	"	"	40501·2
2467·80	1	2467·80 "	"	"	40510·0
2466·87	4	2466·81 "	"	"	40525·3
2466·73	4		"	"	40528·6
2466·00	4	2466·02 "	"	"	40539·6
2465·28	4	2465·23 "	"	"	40551·4
2464·95	4	2465·05 "	"	"	40556·9
2464·10	4	2464·09 "	"	"	40570·9
2463·79	2	2463·86 "	"	"	40576·0
2463·36	4	2463·39 "	"	"	40583·1
2462·73	2	2462·81 "	"	"	40593·4
2462·24	1	2462·30 "	"	"	40601·5
*2461·90	5	2461·89 "	"	"	40607·1
2461·36	5	2461·28 "	"	"	40616·0
2460·60	5n	2460·37 "	"	"	40628·6
2459·50	1	2459·53 "	"	12·0	40646·7
2458·98	3		"	"	40655·3
2458·80	6	2458·78 "	"	"	40658·2
2457·64	2b <sup>v</sup>	2457·68 "	"	"	40677·4
2456·40	2	2456·67 "	"	"	40681·4
2456·18	2	2456·14 "	"	"	40685·1
2456·98	2b	2455·66 "	"	"	40704·9

\* Double.



IRON—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2454.63	4	2454.55 K. & R.	0.80	12.0	40727.3
2454.2	2b		"	"	40734.5
2453.85	2	2453.57 "	"	"	40740.3
2453.56	1		"	"	40745.1
2452.98	1n	2452.67 "	"	"	40754.7
2451.40	1	2451.55 "	"	"	40781.0
2451.29	2	2451.28 "	"	"	40782.8
2451.20	1		"	"	40784.3
2450.28	3		"	"	40799.6
2450.00	3		"	"	40804.3
2449.87	1	2449.93 "	"	"	40806.5
2449.37	1		"	"	40814.8
2449.28	1		"	"	40816.3
2448.80	1	2448.88 "	"	"	40824.3
(2447.79)	4	2447.81 "	"	"	40841.2
*2447.31	4	2447.25 "	"	"	40849.2
2446.50	4	2446.53 "	"	"	40862.7
2446.15	3	2446.30 "	"	"	40868.6
2445.88	2		"	"	40873.1
2445.67	4	2445.68 "	"	"	40876.6
2445.21	2	2445.23 "	"	"	40884.3
2444.57	6	2444.58 "	"	"	40894.9
2443.90	2	2443.94 "	"	12.1	40906.1
2442.62	3	2442.68 "	"	"	40927.5
2442.18	1		"	"	40934.9
2441.62	1	2441.73 "	"	"	40944.0
2441.23	1		"	"	40950.8
2440.48	4	2440.25 "	"	"	40963.5
2440.16	1		"	"	40968.8
2439.79	2	2439.82 "	"	"	40975.0
2439.35	6	2439.36 "	"	"	40982.4
2438.22	1	2438.27 "	"	"	41001.4
2437.75	1		"	"	41009.3
2437.22	3	2437.33 "	"	"	41018.2
2436.70	3		"	"	41027.0
2436.24	2	2436.45 "	"	"	41033.7
2435.84	1	2435.93 "	"	"	41040.8
2434.98	5	2435.04 "	"	"	41056.0
2434.70	5		"	"	41060.7
2434.3	3b		"	"	41067.5
2433.55	5	2433.54 "	"	"	41080.1
2432.92	6	2432.97 "	"	"	41090.8
2432.30	6	2432.34 "	"	"	41100.9
2431.35	1b	2431.38 "	"	"	41117.3
2431.02	1	2431.08 "	"	"	41122.9
2430.90	1		"	"	41124.9
2430.18	7	2430.16 "	"	"	41137.1
2429.95	1		"	"	41141.0
2429.45	3	2429.53 "	"	"	41149.5
2429.08	2	2429.00 "	"	"	41155.7
2428.80	2		"	"	41160.4
2428.41	6	2428.41 "	"	"	41187.1
2427.32	3b	2427.11 "	"	12.2	41185.5
2426.67	1n	2426.46 "	"	"	41196.5
2425.97	2		"	"	41208.4

\* Double.

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2425·73	3	2425·68 K. & R.	0·80	12·2	41212·5
2425·41	2		"	"	41217·9
2424·70	4		"	"	41230·6
2424·49	2		"	"	41233·6
2424·18	7	2424·22 "	"	"	41238·7
2423·28	5	2423·25 "	"	"	41254·2
2423·00	1		"	"	41259·0
2422·75	5	2422·73 "	"	"	41263·2
2421·98	1		"	"	41276·3
2421·82	1n	2421·79 "	"	"	41279·1
2421·0	1b	2421·02 "	"	"	41293·0
2420·1	2b	2420·39 "	"	"	41308·4
2419·42	1	2419·49 "	"	"	41320·0
2418·7	2n		"	"	41332·3
2418·6	2n		"	"	41334·0
2417·91	5	2417·94 "	"	"	41345·8
2416·75	3	2416·68 "	"	"	41365·7
2416·54	3		"	"	41369·3
2415·85	1n	2416·00 "	"	"	41381·1
2415·49	1	2415·29 "	"	"	41387·3
2415·12	3		"	"	41393·6
2414·16	2		"	"	41410·0
2413·36	8	2413·37 "	"	"	41423·8
2412·57	1n	2412·45 "	"	12·3	41437·2
2411·95	1n		"	"	41447·9
2411·72	1	2411·79 "	"	"	41451·9
2411·15	7	2411·16 "	"	"	41461·7
2410·59	8	2410·56 "	"	"	41471·6
2409·78	1		"	"	41485·3
2409·43	1		"	"	41491·3
2408·80	2n		"	"	41502·1
2408·00	2	2408·13 "	"	"	41515·9
2407·08	2		"	"	41531·8
2406·73	6	2406·72 "	"	"	41537·9
2406·18	1		"	"	41547·4
2405·89	1		"	"	41552·4
2405·82	1	2405·02 "	"	"	41553·6
2404·98	7	2404·48 "	"	"	41568·1
2404·49	4		"	"	41576·6
2403·92	1	2402·67 "	"	"	41586·4
2402·70	3		"	"	41607·5
2402·37	1	2402·23 "	"	"	41613·2
2402·14	2	2401·60 "	"	"	41617·2
2401·45	2n	2401·25 "	"	"	41629·2
2400·40	4	2400·39 "	"	"	41647·4
2399·31	8	2399·31 "	"	"	41666·3
2398·77	2n		"	"	41675·7
2398·05	1n	2398·29 "	"	12·4	41688·2
2396·80	3		"	"	41709·9
2395·73	7	2395·62 "	"	"	41728·5
2395·51	4		"	"	41732·4
2394·98	3		"	"	41741·6
2394·20	1b	2394·33 "	"	"	41755·2
2393·35	1b		"	"	41770·1
2393·13	1		"	"	41773·9

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
2392.75	1n	2392.70 K. & R.	0.80	12.4	41780.5
2392.27	1n		"	"	41788.9
2391.59	4	2391.53 "	"	"	41800.1
2391.10	1n		"	"	41809.4
2390.92	1n		"	"	41812.5
2390.31	1n		"	"	41823.2
2390.04	1n	2390.03 "	"	"	41827.9
2389.51	1		"	"	41837.2
2388.71	7	2388.71 " 710 R.	"	"	41851.2
2388.46	2	2388.42 "	"	"	41855.1
2388.28	2		"	"	41859.7
2387.51	3		"	"	41872.2
2386.53	2b		"	"	41889.4
2385.10	2	2385.07 "	"	"	41914.6
2384.49	5	2384.48 "	"	"	41925.3
2383.40	4		"	"	41944.5
2383.17	2	2383.24 "	"	12.5	41948.5
2383.00	2		"	"	41951.4
2382.13	9	2382.15 " 122 R.	"	"	41966.7
2380.86	5	2380.82 "	"	"	41989.1
2380.35	1		"	"	41998.1
2379.36	7	2379.38 "	"	"	42015.6
2379.05	1		"	"	42021.1
2378.57	2		"	"	42029.6
2377.63	1		"	"	42046.2
2376.60	6n	2376.54 "	"	"	42064.4
2375.30	6	2375.30 "	"	"	42087.4
2374.61	1	2374.59 "	"	"	42099.7
2373.82	8	2373.79 " 771 R.	"	"	42013.7
2372.73	4	2372.65 "	"	"	42133.3
2372.50	1n		"	"	42137.1
2371.90	1b		"	"	42147.8
2371.52	1	2371.51 "	"	"	42154.6
2371.07	1n		"	"	42162.6
2370.60	3	2370.56 "	"	"	42170.9
2370.17	5n		"	"	42178.6
2369.33	1	2369.55 "	"	"	42193.5
2368.69	8	2368.66 "	"	12.6	42206.4
2367.00	1		"	"	42235.0
2366.69	3	2366.66 "	"	"	42244.1
2365.92	2n	2365.61 "	"	"	42254.2
(2364.90)	7	2364.88 " 897 R.	"	"	42272.5
2364.00	3n	2363.81 "	"	"	42288.6
2363.68	1n		"	"	42294.3
2362.23	4	2362.11 "	"	"	42320.3
2361.83	3		"	"	42327.4
2360.42	5	2360.37 "	"	"	42352.8
2360.08	5	2360.06 "	"	"	42358.8
2359.68	2		"	"	42366.0
2359.23	7	2359.16 "	"	"	42375.1
2358.43	1		"	"	42388.5
2357.10	3		"	"	42412.4
2356.55	1		"	"	42422.3
2355.50	2b	2355.37 "	"	"	42440.2
2355.29	2		"	"	42445.0



## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
2355.00	5	2354.93 K. & R.	0.80	12.6	42450.2
2354.59	5		"	12.7	42460.7
2353.75	2b		"	"	42472.6
*2352.50	2n		"	"	42495.3
2352.12	1		"	"	42502.1
2351.84	1		"	"	42507.4
2351.31	6	2351.22 "	"	"	42516.8
2350.72	1n	2350.50 "	"	"	42526.5
2350.33	1n		"	"	42534.6
2349.45	1n		"	"	42550.4
2348.40	7	2348.28 " 385 R.	"	"	42569.5
2348.23	7		"	"	42570.5
2346.80	1n		"	"	42598.5
2346.37	1n		"	"	42611.1
2346.0	1n		"	"	42613.0
2345.43	6	2345.29 "	"	"	42623.4
2344.40	5	2344.37 "	"	"	42642.1
2344.05	3		"	"	42648.5
2343.58	9	2343.52 " 57 R.	"	"	42657.1
2342.36	1		"	"	42679.3
2342.07	1		"	"	42684.6
2341.33	1		"	"	42698.0
2341.04	1		"	"	42703.3
2340.55	2n	2340.30 "	"	12.8	42712.2
2339.50	3		"	"	42731.3
2339.05	1		"	"	42739.6
2338.09	8	2338.08 "	"	"	42757.2
2337.65	1		"	"	42765.0
2336.97	2n		"	"	42777.6
2335.55	2n		"	"	42802.9
2335.25	1		"	"	42808.4
2334.5	1b	2334.83 "	"	"	42822.9
2333.84	1		"	"	42835.0
2332.88	8	2332.87 "	"	"	42852.7
2332.62	1		"	"	42857.5
2331.41	7	2331.38 "	"	"	42879.7
2331.18	1		"	"	42883.9
2330.60	1n		"	"	42894.6
2330.17	1n		"	"	42902.5
2329.44	2	2329.67 "	"	"	42916.0
2328.03	2		"	"	42944.0
2327.49	6	2327.40 "	"	12.9	42951.8
2326.95	1n		"	"	42961.8
2326.43	2		"	"	42971.4
2325.80	1b		"	"	42983.0
2325.65	2		"	"	42985.8
2325.38	2		"	"	42990.8
2324.60	1n		"	"	43005.3
2323.2	1b		"	"	43033.0
2322.43	1		"	"	43045.6
2321.76	2		"	"	43058.2
2320.44	2	2320.42 "	"	"	43082.4
2318.62	2		"	"	43118.1
2318.41	1	2318.23 "	"	"	43120.1
2317.40	2n	2317.32 "	"	"	43138.9

\* Double.

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2315·9	1b		0·80	12·9	43166·9
2314·90	1b		"	"	43184·5
2314·05	1	2314·10 K. & R.	"	13·0	43201·3
2313·38	1		"	"	43213·8
2313·17	1	2313·17 "	"	"	43217·7
2312·10	2	2312·40 "	"	"	43237·7
2311·33	3		"	"	43252·1
2310·17	1		"	"	43273·8
2309·04	2	2309·04 "	"	"	43395·0
2308·80	2		"	"	43399·5
2307·75	1		"	"	43319·2
2307·37	3		"	"	43323·4
2306·45	1	2306·35 "	"	"	43343·7
2306·06	1		"	"	43351·0
2304·78	2	2304·82 "	"	"	43375·1
2303·87	1		"	"	43393·2
2303·63	1		"	"	43396·7
2303·42	2	2303·52 "	"	"	43400·7
2301·74	1	2301·75 "	"	"	43432·4
2301·50	1		"	"	43436·9
2301·20	1n		"	13·1	43442·5
2300·48	1n		"	"	43456·1
2300·19	1	2300·20 "	"	"	43461·6
2299·27	1	2299·30 "	"	"	43478·6
2298·68	1		"	"	43590·1
(2298·25)	2	2298·24 "	"	"	43598·3
2297·76	1	2297·85 "	"	"	43507·5
2296·96	1	2297·04 "	"	"	43522·7
2296·87	1		"	"	43524·4
2296·72	1		"	"	43527·2
2296·3	1b	2296·23 "	"	"	43535·2
2295·8	1b		"	"	43544·7
2294·68	2		"	"	43559·9
2294·48	1	2294·45 "	"	"	43569·7
2293·89	2	2293·90 "	"	"	43581·0
2293·20	1		"	"	43594·1
2292·90	1		"	"	43599·8
2292·57	1	2292·56 "	"	"	43606·1
2291·69	1		"	"	43622·8
2291·21	1	2291·18 "	"	"	43632·0
2290·60	1	2290·61 "	"	"	43643·6
2288·8	1b		"	"	43677·9
2287·65	1n	2287·70 "	"	13·2	43699·8
2287·31	1	2287·37 "	"	"	43706·3
2284·10	3	2284·12 "	"	"	43767·7
2283·74	1		"	"	43774·6
2283·37	1	2283·15 "	"	"	43781·7
2279·98	4	2280·05 "	"	"	43846·8
2276·07	2	2276·07 "	"	"	43922·2
2274·13	1	2274·09 "	"	13·3	43959·6
2272·13	1		"	"	43998·2
2271·87	1	2271·84 "	"	"	44003·3
2270·40	1	2270·47 "	"	"	44031·8
2268·91	1	2268·96 "	"	"	44056·7
2268·58	1		"	"	44067·1

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2268.20	1		0.80	13.3	44074.6
2267.64	3	2267.51 K. & R.	"	"	44085.4
2267.14	1		"	"	44095.1
2266.77	1		"	"	44102.4
2266.32	1	2266.37 "	"	"	44111.1
2266.05	1		"	"	44116.4
2264.65	2	2264.51 "	"	"	44143.6
2264.42	1		"	"	44148.1
2263.30	2	2263.37 "	"	13.4	44169.9
2262.75	2		"	"	44180.6
2262.36	1		"	"	44188.2
2260.92	2	2260.83 "	"	"	44216.4
2260.20	1n		"	"	44230.5
2260.13	2	2260.15 "	"	"	44230.8
2259.62	1	2259.50 "	"	"	44241.8
2257.90	2		"	"	44275.4
2257.00	1n		"	"	44293.2
2256.49	1		"	"	44303.2
2255.82	3	2255.94 "	"	"	44316.4
2255.24	1		"	"	44327.8
2254.42	1		"	"	44343.9
2254.25	1		"	"	44347.3
2254.14	1		"	"	44349.4
2253.18	2	2253.15 "	"	"	44368.3
2251.97	2		"	"	44392.2
2251.62	1	2251.6 L. & D.	"	13.5	44418.7
2251.03	2	2251.2 "	"	"	44410.6
2250.24	1	2250.5 "	"	"	44426.2
2249.20	2		"	"	44446.7
2247.80	2n		"	"	44474.4
2247.00	2		"	"	44490.3
2245.64	2n	2245.3 "	"	"	44517.2
2244.38	2n		"	"	44542.2
2243.23	1b		"	"	44565.1
2242.68	1		"	"	44576.0
2242.40	1	2242.2 "	"	"	44581.6
2241.90	1		"	"	44591.5
2241.56	2		"	"	44598.3
2240.63	1		"	"	44616.8
2239.70	1		"	"	44635.3
2239.18	2		"	"	44645.4
2238.71	1		"	13.6	44655.0
2238.33	1n		"	"	44662.6
2237.96	2		"	"	44670.0
2237.66	2		"	"	44696.5
2235.93	1		"	"	44710.5
2235.58	1		"	"	44717.5
2234.00	3		"	"	44749.2
2232.19	2		"	"	44785.4
2231.64	2		"	"	44896.5
2228.88	2		"	"	44852.0
2227.68	1		"	"	44876.2
2227.55	1		"	"	44878.8
2227.45	1	2227.3 "	"	"	44880.8
2227.23	1		"	"	44885.2

1898.

D



## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2224.58	1		0.80	13.7	44938.6
2223.56	2		"	"	44980.1
2222.53	1		"	"	44959.3
2221.25	2		"	"	44996.0
2220.48	3		"	"	45021.6
2219.97	2		"	"	45032.0
2218.90	2		"	"	45053.7
2217.15	1		"	"	45189.2
2215.88	1n		"	"	45115.0
2215.22	1n		"	13.8	45128.5
2214.20	1n	2214.1 L. & D.	"	"	45149.2
2213.74	3		"	"	45158.6
2211.19	1		"	"	45210.7
2209.78	1		"	"	45239.6
2209.18	2		"	"	45251.9
2208.54	2		"	"	45265.0
2206.68	1		"	"	45303.1
2206.30	2n		"	"	45310.9
2201.72	1n		"	13.9	45486.1
2200.81	1		"	"	45423.9
2200.44	1	2200.2 "	"	"	45431.6
2198.86	1n		"	"	45464.2
2196.14	1		"	"	45520.5
2192.30	1		"	14.0	45600.2
2192.08	1		"	"	45604.8
2191.94	1		"	"	45607.7
2189.12	1		"	"	45666.5
2187.82	1		"	"	45793.7
2187.40	1		"	"	45702.4
2187.28	1		"	"	45704.9
2186.92	1	2286.8 "	"	"	45712.6
2186.56	1		"	"	45719.9
2183.85	1	2283.7 "	"	"	45776.7
2180.55	1		"	14.1	45845.8
2178.15	1	2278.0 "	"	"	45996.4
2177.10	1	2177.0 "	"	"	45918.6
2176.68	1		"	"	45927.4
2175.54	2		"	"	45951.5
2174.95	1		"	"	45963.9
2174.77	1		"	"	45967.8
2173.07	1		"	"	46003.8
2167.90	1		"	14.2	46113.4
2167.50	1	2167.4 "	"	"	46121.9
2166.81	2		"	"	46136.6
2164.40	1		"	"	46188.0
2162.08	2		"	"	46237.6
2161.18	1		"	"	46256.8
2152.42	1		"	14.3	46445.0
2151.9	1n		"	"	46455.9
2151.15	1		"	"	46472.5
2150.67	1		"	"	46482.9
2147.74	1		"	14.4	46546.2
2146.06	1		"	"	46531.6
2136.50	1		"	14.5	46791.0
2136.00	1		"	"	46812.0

## IRON—continued.

Wave-length Spark Spectrum	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
2097·60	1		0·80	14·8	47658·7
2097·48	1		"	"	47661·4
2087·54	1		"	14·9	47888·4
2079·00	1		"	15·0	48085·0
2068·25	1n		"	15·1	48334·9

## TUNGSTEN (SPARK SPECTRUM).

Exner and Haschek : ' Sitzber. k. Akad. W. Wien,' civ. (1895), cv. (1896), cvi. (1897).

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
4844·7	1		1·33	5·7	20635
4694·1	2n		1·29	5·9	21297
4692·0	2n		1·28	"	21307
4687·9	1		"	"	21326
4683·7	2		"	"	21345
4682·8	1		"	"	21349
4681·4	1		"	"	21355
4680·8	6	4680·6 Thalén	"	"	21358
4679·8	1		"	"	21362
4679·3	1		"	"	21365
4678·8	1		"	"	21367
4677·9	1		"	"	21371
4676·9	1		"	"	21376
4675·4	1n		"	"	21383
4675·2	1n		"	"	21383
4672·4	1		"	"	21396
4671·9	1		"	"	21399
4671·6	1		"	"	21400
4668·7	1		"	"	21413
4666·0	2		"	"	21425
4665·0	1n		"	"	21430
4664·1	1n		"	"	21434
4663·2	1n		"	"	21438
4662·1	1		"	"	21444
4661·7	1		"	"	21445
4661·4	1		"	"	21447
4660·0	6	4660·6 "	"	"	21453
4658·3	1	4659·6 "	"	"	21461
4657·6	4		"	"	21464
4655·5	1n		"	"	21474
4654·4	1n		1·27	"	21479
4650·9	2n		"	"	21495
4646·3	1		"	"	21517
4645·3	1		"	"	21521
4645·1	1		"	"	21522
4642·7	2		"	"	21533
4640·4	1		"	"	21544

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4638.0	1n		1.27	5.9	21555
4637.4	1n		"	"	21558
4636.2	1		"	"	21563
4634.8	2		"	6.0	21570
4633.3	1n		"	"	21577
4632.7	1n		"	"	21580
4631.8	1n		"	"	21584
4629.9	1		"	"	21593
4629.5	1		"	"	21595
4629.0	1		"	"	21597
4628.6	1		"	"	21599
4627.8	1n		"	"	21603
4627.4	1n		"	"	21604
4627.1	1n		"	"	21606
4626.3	1n		"	"	21611
4625.4	1n		"	"	21614
4623.9	1n		"	"	21621
4623.5	1		"	"	21623
4620.8	1		"	"	21635
4616.6	1n		1.26	"	21655
4615.0	1		"	"	21662
4613.50	4		"	"	21669.5
4610.0	2		"	"	21686
4609.0	1n		"	"	21691
4606.6	1		"	"	21704
4604.8	2		"	"	21710
4603.5	1b		1.26	6.0	21717
4601.6	1b		"	"	21726
4601.0	1		"	"	21728
4600.6	1		"	"	21730
4600.1	2		"	"	21733
4598.4	1		"	"	21741
4592.60	4		"	"	21768.2
4588.92	4		"	"	21785.6
4587.8	1n		"	"	21791
4586.9	2		"	"	21795
4586.1	1		"	"	21799
4585.5	1n		"	"	21802
4584.8	1n		"	"	21805
4582.2	1		"	"	21818
4579.8	1n		1.25	"	21829
4578.3	2		"	"	21836
4575.2	1n		"	"	21851
4572.8	1		"	"	21862
4572.6	1		"	"	21863
4571.9	1		"	"	21871
4570.80	4		"	"	21872.0
4569.3	1n		"	"	21879
4567.6	1n		"	"	21887
4567.3	1n		"	"	21889
4566.3	1		"	"	21894
4565.4	1		"	"	21898
4564.1	1		"	6.1	21904
4563.7	1		"	"	21906
4562.1	1		"	"	21914



TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4561·6	1		1·25	6·1	21916
4560·4	1		"	"	21922
4559·0	1		"	"	21929
4556·8	1		"	"	21939
4555·3	1n		"	"	21946
4554·22	8		"	"	21951·6
4552·6	1		"	"	21959
4551·9	2		"	"	21963
4550·4	1		"	"	21970
4549·8	1n		"	"	21973
4546·5	1		"	"	21989
4545·6	1n		"	"	21993
4544·6	1n		"	"	21998
4543·6	2		"	"	22003
4542·9	1		1·24	"	22006
4542·0	1		"	"	22011
4540·3	1		"	"	22019
4539·8	1		"	"	22021
4536·6	2		"	"	22037
4535·0	2		"	"	22045
4534·6	2		"	"	22047
4532·3	1		"	"	22058
4530·5	1		"	"	22067
4529·8	1		"	"	22070
4528·6	1n		"	"	22076
4527·3	1		"	"	22082
4522·9	1n		"	"	22104
4520·0	1n		"	"	22118
4519·1	1		"	"	22122
4517·4	1		"	"	22131
4516·5	1n		"	"	22135
4515·8	1n		"	"	22138
4514·1	1n		"	"	22147
4513·1	2		"	"	22152
4512·8	2		"	"	22153
4511·0	1		"	"	22162
4509·6	1		"	"	22169
4509·3	1		"	"	22170
4508·9	1		"	"	22172
4508·4	1		"	"	22175
4504·8	2		1·23	"	22193
4504·0	2		"	"	22196
4503·1	1		"	"	22201
4502·3	1		"	"	22205
4500·3	1		"	"	22215
4500·2	1		"	"	22215
4498·6	2		"	"	22223
4497·8	1		"	"	22227
4497·0	1		"	6·2	22231
4496·4	1n		"	"	22234
4495·4	1		"	"	22239
4494·7	1		"	"	22242
4494·0	2		"	"	22246
4492·4	1		"	"	22254
4490·0	1		"	"	22266

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4489.1	2		1.23	6.2	22270
4488.5	1		"	"	22273
4487.8	1		"	"	22277
4487.5	1n		"	"	22278
4485.3	1		"	"	22289
4484.33	6		"	"	22293.7
4482.0	1		"	"	22305
4481.5	2		"	"	22308
4480.3	1		"	"	22314
4479.0	1		"	"	22320
4478.6	1		"	"	22321
4476.0	1		"	"	22335
4475.7	1		"	"	22337
4475.0	1n Mo		"	"	22340
4474.1	2		"	"	22345
4473.0	1		"	"	22350
4472.6	1		"	"	22352
4472.0	1		"	"	22355
4471.6	1		"	"	22357
4469.9	1		"	"	22366
4468.8	2		1.22	"	22371
4466.9	2		"	"	22381
4466.5	2		"	"	22383
4465.8	1		"	"	22386
4463.5	1		"	"	22398
4463.1	1		"	"	22400
4462.6	1		"	"	22402
4460.6	2		"	"	22413
4459.3	1b		"	"	22419
4458.4	1		"	"	22424
4458.2	1		"	"	22425
4456.2	1		"	"	22435
4451.9	1		"	"	22441
4452.3	1		"	"	22454
4450.4	1		"	"	22464
4449.9	1		"	"	22466
4449.0	2		"	"	22471
4445.2	2		"	"	22490
4444.6	1		"	"	22493
4444.2	1		"	"	22495
4443.1	1		"	"	22501
4442.8	1		"	"	22502
4442.5	1		"	"	22504
4441.9	2		"	"	22507
4439.8	1		"	"	22518
4439.0	2		"	"	22522
4438.5	1		"	"	22524
4437.6	1		"	"	22529
4437.0	2		"	"	22532
4435.8	1		"	"	22538
4435.1	1 Mo		"	"	22541
4433.7	1n		"	"	22549
4433.1	1		"	"	22552
4432.2	1		1.21	"	22556
4430.9	1n		"	6.3	22563

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda -}$	
4429.0	1		1.21	6.3	22572
4428.6	1		"	"	22574
4427.6	1n		"	"	22580
4425.6	1		"	"	22590
4425.1	1		"	"	22592
4423.8	2		"	"	22599
4422.8	1n		"	"	22604
4422.6	1		"	"	22605
4421.9	2		"	"	22609
4421.1	1		"	"	22613
4420.6	2		"	"	22615
4419.4	1		"	"	22622
4418.9	1		"	"	22624
4418.6	1		"	"	22626
4415.8	1		"	"	22640
4413.4	1		"	"	22652
4413.2	1		"	"	22653
4412.4	1 Mo		"	"	22657
4411.5	1		"	"	22662
4411.1	1		"	"	22664
4410.0	1		"	"	22670
4409.6	1n		"	"	22672
4408.8	1		"	"	22676
4408.42	4		"	"	22677.6
4406.1	2		"	"	22690
4404.8	1		"	"	22697
4403.5	1		"	"	22703
4402.8	1		"	"	22707
4400.3	1n		"	"	22720
4396.9	1		"	"	22737
4395.1	1		"	"	22747
4394.5	1		"	"	22750
4393.8	2		1.20	"	22753
4390.9	1		"	"	22768
4389.9	2		"	"	22774
4387.9	1n		"	"	22784
4387.5	1		"	"	22786
4386.7	1		"	"	22790
4385.01	4		"	"	22798.7
4383.6	4		"	"	22806
4381.8	1n		"	"	22816
4380.1	1		"	"	22825
4379.3	1		"	"	22829
4378.72	4		"	"	22831.4
4377.5	1n		"	"	22838
4373.8	1n		"	"	22857
4373.0	1n		"	"	22862
4372.5	2		"	"	22864
4371.8	1		"	"	22868
4370.8	1		"	"	22873
4368.7	1		"	"	22884
4366.20	4		"	6.4	22886.8
4364.90	4		"	"	22903.6
4361.6	2		"	"	22921
4361.1	1		"	"	22924



TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4360.0	1n		1.20	6.4	22930
4359.3	1n		"	"	22933
4358.6	1n		"	"	22937
4358.0	1n		"	"	22940
4356.5	1n		1.19	"	22948
4355.2	2		"	"	22955
4354.2	2		"	"	22960
4348.23	6		"	"	22991.5
4347.0	2		"	"	22998
4346.3	1		"	"	23002
4345.9	1		"	"	23004
4345.1	1		"	"	23008
4343.2	2		"	"	23018
4342.4	1		"	"	23023
4341.3	1n		"	"	23029
4339.5	1		"	"	23038
4339.1	1		"	"	23040
4338.6	1		"	"	23043
4338.2	1n		"	"	23045
4335.70	4		"	"	23057.9
4332.0	4		"	"	23078
4330.7	2		"	"	23085
4326.9	1n		"	"	23105
4325.1	1n		"	"	23115
4324.6	1		"	"	23118
4322.9	1		"	"	23127
4321.5	1n		"	"	23134
4320.4	1n		"	"	23140
4318.6	1		1.18	"	23150
4316.8	2		"	"	23159
4316.3	1n		"	"	23162
4315.3	1n		"	"	23167
4313.1	1n		"	"	23179
4312.8	1n		"	"	23181
4312.3	1		"	"	23183
4311.0	1n		"	"	23190
4310.2	1		"	"	23195
4310.0	1		"	"	23196
4309.3	1		"	"	23200
4309.0	1		"	"	23201
4308.0	6Fe		"	6.5	23207
4307.00	4		"	"	23211.5
4306.3	1		"	"	23216
4305.8	1		"	"	23218
4305.6	1		"	"	23220
4305.1	1n		"	"	23222
4303.4	4		"	"	23231
4302.6	1		"	"	23236
4302.27	6	4302.0 Thalén	"	"	23237.0
4301.1	1		"	"	23244
4299.0	1n		"	"	23255
4297.6	1n		"	"	23263
4297.2	1n		"	"	23265
4295.7	1n		"	"	23273
4294.77	8	4295.0 "	"	"	23277.6

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4294.1	2		1.18	6.5	23282
4293.0	1n				23288
4292.8	1n		"	"	23289
4292.0	1n		"	"	23293
4291.5	1n		"	"	23296
4290.1	1		"	"	23303
4289.3	1		"	"	23308
4288.4	1		"	"	23313
4287.0	1n		"	"	23320
4286.0	2		"	"	23326
4285.0	2		"	"	23331
4283.8	1		"	"	23338
4283.0	1n		"	"	23342
4282.0	1		"	"	23348
4281.4	1n		"	"	23351
4280.5	1n		1.17	"	23356
4279.0	1		"	"	23364
4278.5	1		"	"	23367
4277.8	1		1.17	6.5	23371
4277.4	1		"	"	23373
4276.92	4 Mo		"	"	23374.8
4276.0	1		"	"	23380
4275.65	4		"	"	23381.8
4275.0	1		"	"	23386
4274.70	4		"	"	23387.0
4273.7	2		"	"	23393
4272.3	1		"	"	23401
4271.8	1		"	"	23403
4270.9	1		"	"	23408
4270.8	1		"	"	23409
4269.9	2		"	"	23414
4269.52	6	4269.0 Thalén	"	"	23415.3
4268.8	1		"	"	23420
4268.1	1		"	"	23424
4267.9	1		"	"	23425
4266.6	2		"	"	23432
4265.0	1		"	"	23441
4263.50	4		"	"	23448.4
4262.4	1		"	"	23455
4260.42	4		"	"	23465.4
4259.9	1		"	"	23469
4259.52	4		"	"	23470.3
4258.5	1		"	"	23476
4257.3	1		"	"	23483
4257.0	1		"	"	23485
4256.6	1		"	"	23492
4254.3	2		"	"	23500
4254.1	1		"	"	23501
4252.6	1n		"	6.6	23508
4251.8	1n		"	"	23512
4250.8	1		"	"	23518
4250.1	1n		"	"	23522
4249.5	1		"	"	23525
4248.8	1		"	"	23529
4248.2	1		"	"	23532

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4247·6	1		1·17	6·6	23536
4247·3	1		"	"	23537
4246·0	1		"	"	23545
4245·6	1		"	"	23547
4244·45	4		"	"	23553·6
4243·8	1		1·16	"	23557
4243·4	1		"	"	23549
4241·50	4		"	"	23570·0
4241·0	1		"	"	23572
4240·8	1		"	"	23573
4240·4	1		"	"	23576
4240·1	1		"	"	23577
4238·6	1		"	"	23586
4236·6	1		"	"	23597
4235·5	1		"	"	23603
4234·4	2		"	"	23609
4233·0	1		"	"	23617
4232·6	1		"	"	23619
4231·9	1		"	"	23623
4231·8	1		"	"	23624
4231·4	1		"	"	23626
4231·3	1		"	"	23626
4230·0	ln		"	"	23634
4229·1	1		"	"	23639
4228·5	1		"	"	23642
4227·6	1		"	"	23647
4226·8	6C		"	"	23652
4226·4	1		"	"	23654
4225·7	1		"	"	23658
4225·0	2		"	"	23662
4224·9	2		"	"	23662
4224·1	ln		"	"	23667
4222·2	2		"	"	23677
4222·0	1		"	"	23678
4221·5	1		"	"	23681
4220·7	1		"	"	23686
4220·5	1		"	"	23687
4219·50	4		"	"	23692·9
4219·2	1		"	"	23694
4218·7	1		"	"	23697
4216·0	1		"	"	23712
4215·60	6		"	"	23714·8
4215·1	1		"	"	23717
4214·5	1		"	"	23721
4214·0	1		"	"	23723
4213·5	1		"	"	23726
4212·9	1		"	"	23730
4211·5	1		"	"	23738
4210·4	1		"	"	23744
4210·3	1		"	"	23744
4209·7	ln		"	"	23748
4207·12	4		"	"	23762·6
4206·3	2		"	"	23767
4205·6	ln		1·15	"	23771
4204·52	4		"	"	23777·3



TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuum
			$\lambda +$	$\frac{1}{\lambda} -$	
4203·8	2		1·15	6·6	23781
4202·0	1		"	"	23791
4201·3	1		"	"	23795
4200·9	1		"	"	23797
4200·5	1		"	"	23800
4200·1	1		"	6·7	23802
4199·7	1		"	"	23804
4198·9	1		"	"	23809
4198·7	1		"	"	23810
4198·3	1		"	"	23812
4197·9	1		"	"	23814
4197·4	1		"	"	23817
4197·3	1		"	"	23818
4193·9	1n		"	"	23837
4193·0	1n		"	"	23842
4189·3	1		"	"	23863
4187·0	1n		"	"	23876
4186·0	1		"	"	23882
4185·5	1		"	"	23885
4183·7	1		"	"	23895
4183·6	1		"	"	23896
4183·0	1n		"	"	23899
4182·6	1		"	"	23902
4181·5	1		"	"	23908
4180·4	2		"	"	23914
4178·7	1		"	"	23924
4178·0	1n		"	"	23928
4177·0	1		"	"	23934
4176·9	1		"	"	23934
4176·0	1		"	"	23939
4175·70	4		"	"	23941·4
4175·2	2n		"	"	23944
4174·6	1n		"	"	23947
4172·9	1n		"	"	23957
4172·1	1		"	"	23962
4171·9	1		"	"	23963
4171·23	4		"	"	23967·0
4170·60	4		1·14	"	23970·7
4168·80	4		"	"	23981·0
4168·3	1		"	"	23984
4166·9	1		"	"	23992
4166·2	1		"	"	23996
4165·7	1n		"	"	23999
4164·9	1		"	"	24003
4164·0	1		"	"	24008
4163·0	1n		"	"	24014
4161·6	1		"	"	24022
4161·0	1		"	"	24026
4160·4	1		"	"	24029
4160·0	1		"	"	24031
4159·0	1		"	"	24037
4157·1	2		"	"	24048
4154·8	2		"	"	24062
4153·2	1		"	"	24071
4152·6	1		"	"	24074

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
4151.8	1		1.14	6.7	24079
4151.1	1		"	"	24083
4150.6	1		"	"	24087
4150.0	1		"	"	24089
4149.8	1		"	"	24091
4149.5	1		"	"	24092
4149.3	1n		"	"	24093
4148.3	1		"	6.8	24099
4146.8	2		"	"	24108
4145.3	2		"	"	24117
4144.6	1		"	"	24121
4143.1	1		"	"	24130
4142.3	2		"	"	24134
4141.6	1		"	"	24138
4140.9	1		"	"	24142
4140.4	1		"	"	24145
4140.1	1		"	"	24147
4139.3	1		"	"	24152
4138.5	1		"	"	24156
4138.3	1		"	"	24158
4138.1	1		"	"	24159
4137.63	4		"	"	24161.6
4137.5	4		"	"	24162
4136.5	1		"	"	24168
4134.7	1n		"	"	24179
4133.6	2		"	"	24185
4132.3	1		"	"	24193
4130.9	1		1.13	"	24201
4130.6	1		"	"	24203
4130.2	1		"	"	24205
4127.0	1		"	"	24224
4126.9	2		"	"	24224
4125.2	1		"	"	24234
4123.0	1		"	"	24247
4122.7	1		"	"	24249
4122.0	1		"	"	24253
4120.8	1		"	"	24260
4119.0	1		"	"	24271
4118.22	4		"	"	24275.5
4114.8	1		"	"	24296
4114.2	2		"	"	24299
4113.9	1		"	"	24301
4112.4	1		"	"	24310
4111.8	2		"	"	24313
4110.6	2		"	"	24320
4109.90	4		"	"	24324.7
4108.5	1		"	"	24333
4107.9	1		"	"	24336
4106.8	1		"	"	24343
4104.0	1		"	"	24359
4102.90	6		"	"	24366.2
4101.8	1		"	"	24373
4101.0	1		"	"	24377
4099.2	2		"	6.9	24388
4097.2	1		"	"	24400

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4096·6	1		1.13	6·9	24403
4095·8	1		"	"	24408
4094·3	1n		"	"	24417
4093·3	1		1.12	"	24423
4092·5	1		"	"	24428
4091·3	1		"	"	24435
4091·2	1		"	"	24436
4090·8	1		"	"	24438
4090·3	1		"	"	24441
4089·6	1		"	"	24445
4088·9	2		"	"	24449
4088·5	2		"	"	24452
4087·6	1		"	"	24457
4087·1	1		"	"	24460
4084·5	1n		"	"	24476
4083·9	1n		"	"	24479
4083·1	2		"	"	24484
4081·45	4		"	"	24494·2
4081·3	1		"	"	24495
4079·5	1		"	"	24506
4079·1	1		"	"	24508
4078·3	1		"	"	24513
4077·9	2		"	"	24515
4075·7	1		"	"	24529
4074·52	6		"	"	24535·9
4073·2	1		"	"	24544
4073·1	1		"	"	24544
4070·7	2		"	"	24559
4070·03	6		"	"	24562·9
4067·0	1		"	"	24581
4065·5	1		"	"	24590
4065·0	2		"	"	24593
4063·8	1		"	"	24601
4060·9	1n		"	"	24618
4060·3	1		"	"	24622
4059·2	1n		"	"	24628
4058·0	1		"	"	24636
4057·5	1		"	"	24639
4056·8	1		"	"	24643
4055·8	1		"	"	24649
4055·2	1		"	"	24653
4053·5	1		1.11	"	24663
4052·5	1		"	"	24669
4051·5	1		"	"	24675
4050·1	1n		"	7·0	24684
4048·5	1		"	"	24694
4048·1	1		"	"	24696
4046·8	1		"	"	24704
4045·80	4		"	"	24710·0
4044·1	1		"	"	24720
4042·5	1		"	"	24730
4041·7	1		"	"	24735
4041·2	1		"	"	24738
4040·7	1		"	"	24741
4040·0	1		"	"	24745



TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4039.5	1		1.11	7.0	24749
4037.8	1		"	"	24759
4037.0	1		"	"	24764
4035.3	1		"	"	24774
4033.9	1		"	"	24783
4032.5	1n		"	"	24792
4031.6	1		"	"	24797
4031.4	1		"	"	24798
4030.0	1		"	"	24807
4029.7	1		"	"	24809
4029.0	1		"	"	24813
4028.9	1		"	"	24814
4028.4	1n		"	"	24817
4025.6	1		"	"	24834
4025.1	1		"	"	24837
4024.9	1		"	"	24838
4022.8	1		"	"	24851
4022.1	1		"	"	24856
4020.8	1		"	"	24864
4019.7	1n		"	"	24870
4019.3	2		"	"	24873
4017.0	1		"	"	24887
4016.2	1		"	"	24892
4015.32	4		1.10	"	24897.6
4013.9	1		"	"	24906
4013.8	1		"	"	24907
4013.2	1		"	"	24911
4012.2	1		"	"	24917
4012.0	1		"	"	24918
4011.8	1		"	"	24919
4011.1	1		"	"	24924
4011.0	1		"	"	24924
4010.3	1		"	"	24929
4009.7	1		"	"	24933
4008.90	8		"	"	24937.5
4007.0	1		"	"	24949
4005.7	1		"	"	24957
4005.3	1		"	"	24960
4004.1	1		"	"	24967
4003.8	1		"	7.1	24969
4002.8	1		"	"	24976
4001.5	1		"	"	24984
4000.7	1		"	"	24989
3998.7	1		"	"	25001
3998.2	1		"	"	25004
3997.8	1		"	"	25007
3997.3	1		"	"	25010
3997.1	1		"	"	25011
3995.0	1		"	"	25024
3993.8	1		"	"	25032
3992.5	1		"	"	25040
3991.3	1		"	"	25047
3990.5	1		"	"	25053
3988.8	1		"	"	25063
3988.5	1		"	"	25065

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
3988.0	1		1.10	7.1	25068
3987.5	1		"	"	25071
3987.1	1		"	"	25074
3986.3	1n		"	"	25079
3984.9	1		"	"	25088
3984.2	1		"	"	25092
3983.40	4		"	"	25097.1
3980.7	2		"	"	25114
3980.0	1		"	"	25119
3979.3	4		"	"	25123
3977.8	1		"	"	25133
3976.5	1n		"	"	25141
3975.9	1		1.09	"	25145
3975.5	1		"	"	25147
3972.5	1		"	"	25166
3972.0	1		"	"	25169
3970.7	4		"	"	25177
3969.3	1		"	"	25186
3965.1	6		"	"	25213
3964.2	1		"	"	25219
3962.4	1		"	"	25230
3961.7	2		"	"	25235
3960.8	1		"	"	25240
3960.1	1n		"	"	25245
3959.5	1n		"	"	25249
3958.9	1		"	"	25253
3957.6	1		"	"	25261
3957.2	1		"	"	25263
3955.7	2		"	7.2	25273
3953.8	1		"	"	25285
3953.5	1		"	"	25287
3953.2	2		"	"	25289
3953.0	1		"	"	25290
3952.3	1		"	"	25295
3952.0	1		"	"	25297
3951.1	2		"	"	25302
3950.3	2		"	"	25308
3948.8	1		"	"	25317
3948.3	1		"	"	25320
3948.2	2		"	"	25321
3946.5	1		"	"	25332
3945.0	2		"	"	25342
3944.3	2		"	"	25346
3942.5	1		"	"	25358
3942.0	1		"	"	25361
3941.7	1		"	"	25363
3941.1	1		"	"	25367
3940.6	1		"	"	25370
3938.3	1		"	"	25385
3937.8	1		"	"	25388
3937.2	2		"	"	25392
3935.5	2		1.08	"	25403
3935.2	1		"	"	25405
3931.7	1		"	"	25427
3931.1	1		"	"	25431

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3930.7	1		1.08	7 2	25434
3930.5	1		"	"	25435
3928.0	1		"	"	25451
3926.2	1		"	"	25463
3925.3	1		"	"	25469
3924.9	1		"	"	25471
3924.6	1		"	"	25473
3923.1	1		"	"	25483
3922.9	1		"	"	25494
3918.8	1		"	"	25511
3918.5	1		"	"	25513
3917.8	1		"	"	25518
3917.6	1		"	"	25519
3915.5	2n		"	"	25533
3914.3	1n		"	"	25540
3913.8	1		"	"	25544
3913.5	1		"	"	25546
3913.0	1		"	"	25549
3911.5	1		"	"	25559
3909.4	1		"	"	25572
3907.5	1		"	7.3	25585
3907.3	1		"	"	25586
3906.1	1		"	"	25594
3906.0	1		"	"	25595
3905.8	1		"	"	25596
3904.2	1		"	"	25606
3903.5	1		"	"	25611
3903.1	1		"	"	25614
3902.0	1		"	"	25621
3901.5	1		"	"	25624
3901.0	1		"	"	25627
3900.0	1		"	"	25634
3899.0	1		"	"	25641
3898.2	2		"	"	25646
3897.07	4		"	"	25653.0
3895.8	1n		1.07	"	25662
3894.2	1		"	"	25672
3893.7	1		"	"	25676
3893.0	2		"	"	25680
3892.1	1		"	"	25686
3891.0	1		"	"	25693
3889.5	1n		"	"	25703
3888.7	1n		"	"	25709
3888.2	1		"	"	25712
3886.9	1		"	"	25720
3886.5	1		"	"	25723
3884.2	1		"	"	25738
3884.0	1		"	"	25740
3883.5	1n		"	"	25743
3882.7	1n		"	"	25748
3881.50	4		"	"	25755.9
3880.3	1		"	"	25764
3879.7	1		"	"	25768
3879.4	1		"	"	25770
3879.2	1		"	"	25772



TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3878.7	1		1.07	7.3	25775
3878.3	1		"	"	25777
3877.9	1		"	"	25780
3877.5	2		"	"	25783
3876.2	1n		"	"	25791
3876.0	2		"	"	25793
3874.7	2		"	"	25801
3873.1	2		"	"	25812
3872.8	2n		"	"	25814
3871.8	1n		"	"	25821
3870.8	1n		"	"	25827
3869.6	1n		"	"	25835
3868.7	1		"	"	25841
3868.05	4		"	"	25845.5
3867.5	1		"	"	25849
3866.2	1		"	"	25858
3865.5	1		"	"	25863
3864.6	2		"	"	25869
3863.8	1		"	"	25874
3863.0	1		"	"	25880
3862.7	1		"	"	25882
3861.3	1		"	"	25891
3861.2	1		"	"	25893
3860.1	2		"	"	25899
3859.5	2		"	"	25903
3859.0	1		"	"	25906
3857.6	1		"	"	25916
3857.5	1		"	"	25917
3857.0	2		"	"	25920
3856.6	2		1.06	"	25923
3856.2	1		"	"	25925
3855.7	1		"	"	25929
3855.5	1		"	"	25930
3854.8	1		"	"	25935
3854.0	1		"	"	25940
3853.0	1		"	"	25947
3851.70	4		"	"	25955.3
3851.3	1		"	"	25958
3850.2	1		"	"	25966
3847.7	2		"	"	25983
3846.32	4		"	"	25991.6
3846.0	1		"	"	25994
3844.5	1		"	"	26004
3843.8	1		"	"	26009
3843.5	1		"	"	26011
3842.6	2		"	"	26017
3841.2	1n		"	"	26027
3840.5	1		"	"	26031
3839.4	1		"	"	26039
3838.6	2		"	"	26044
3838.1	1		"	"	26048
3837.9	1		"	"	26049
3837.4	2		"	"	26052
3836.7	1		"	"	26057
3836.0	1n		"	"	26062
1898.					

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3835.13	4		1.06	7.3	26067.4
3834.4	1		"	"	26073
3834.3	1		"	"	26073
3833.1	1		"	"	26082
3832.8	1		"	"	26084
3832.5	1		"	"	26086
3830.9	1n		"	"	26097
3830.7	1		"	"	26098
3830.4	1		"	"	26100
3830.0	1		"	"	26103
3829.3	1		"	"	26107
3828.1	2		"	"	26116
3827.4	1b		"	"	26120
3826.3	1		"	"	26128
3825.6	1		"	"	26133
3825.4	1		"	"	26134
3824.6	2		"	"	26140
3823.2	2		"	"	26149
3823.0	1		"	"	26150
3822.3	1		"	"	26155
3821.8	1n		"	"	26159
3820.6	2		"	"	26167
3819.2	1		"	"	26176
3819.1	1		"	"	26177
3818.0	1n		"	"	26185
3817.60	4		"	7.4	26187.1
3816.5	2		1.05	"	26195
3816.0	2		"	"	26198
3815.3	1n		"	"	26203
3814.6	1		"	"	26208
3813.2	1n		"	"	26218
3812.8	1n		"	"	26220
3810.9	2		"	"	26234
3810.5	2		"	"	26236
3810.0	1		"	"	26240
3809.3	2		"	"	26245
3807.8	1		"	"	26255
3807.5	1		"	"	26257
3806.8	1n		"	"	26262
3805.8	1		"	"	26269
3805.5	1		"	"	26271
3804.6	1		"	"	26277
3804.2	1		"	"	26280
3803.4	1		"	"	26285
3803.1	1		"	"	26287
3802.1	2		"	"	26294
3801.6	1		"	"	26298
3800.2	1		"	"	26307
3799.7	1		"	"	26311
3799.2	1		"	"	26314
3796.4	2n		"	"	26334
3795.0	1		"	"	26343
3794.4	2		"	"	26349
3793.5	1		"	"	26354
3792.8	2		"	"	26359

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3792.3	1		1.05	7.4	26362
3791.6	1		"	"	26367
3791.5	1		"	"	26368
3791.0	1n		"	"	26371
3790.1	2		"	"	26378
3788.0	1		"	"	26392
3786.5	1		"	"	26403
3786.2	1		"	"	26405
3783.9	1		"	"	26421
3783.6	1		"	"	26423
3782.9	1		"	"	26428
3782.0	1		"	"	26434
3781.5	1		"	"	26438
3780.91	4		"	"	26441.3
3778.3	1		"	"	26460
3777.5	2		"	"	26466
3775.5	2		1.04	"	26480
3774.3	2		"	"	26488
3773.85	4		"	"	26490.7
3772.6	1		"	7.5	26500
3772.2	1		"	"	26502
3770.0	1		"	"	26518
3769.4	1		"	"	26521
3768.62	4		"	"	26527.4
3768.0	1		"	"	26531
3767.5	1		"	"	26535
3767.3	1		"	"	26536
3767.0	1		"	"	26538
3765.5	1b		"	"	26549
3764.6	1		"	"	26555
3764.0	1		"	"	26559
3763.2	1		"	"	26565
3761.7	1		"	"	26576
3761.5	1		"	"	26577
3760.5	2		"	"	26584
3760.3	2		"	"	26586
3759.3	1		"	"	26593
3758.4	1		"	"	26599
3757.0	2n		"	"	26609
3755.0	1		"	"	26623
3754.9	1		"	"	26624
3753.7	2		"	"	26632
3753.3	1		"	"	26635
3751.5	1		"	"	26648
3750.8	1		"	"	26653
3748.4	1		"	"	26670
3747.9	1		"	"	26674
3747.6	1		"	"	26676
3747.0	1		"	"	26680
3745.70	4 Fe		"	"	26689.8
3744.4	1		"	"	26699
3744.2	1		"	"	26700
3743.5	1		"	"	26705
3742.7	1		"	"	26711
3741.9	4		"	"	26716



TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
3739.7	1		1.04	7.5	26732
3739.3	1		"	"	26735
3738.9	1		"	"	26738
3737.1	2b		1.03	"	26751
3736.38	6		"	"	26756.4
3735.5	1		"	"	26762
3733.7	1		"	"	26775
3733.5	1		"	"	26777
3732.7	1n		"	"	26782
3732.1	1		"	"	26787
3731.9	1		"	"	26788
3730.6	1		"	"	26797
3729.9	1		"	"	26802
3729.4	1		"	"	26806
3728.5	1n		"	"	26812
3726.2	1		"	7.6	26829
3725.3	1		"	"	26835
3724.6	1		"	"	26841
3722.7	1		"	"	26854
3721.3	2		"	"	26864
3720.7	1		"	"	26869
3720.0	2		"	"	26874
3719.6	2		"	"	26877
3718.7	1		"	"	26883
3718.4	1		"	"	26885
3718.0	1		"	"	26888
3717.3	1		"	"	26893
3716.20	4		"	"	26901.6
3715.1	1		"	"	26909
3715.0	1		"	"	26910
3714.8	1		"	"	26911
3714.3	1		"	"	26915
3713.8	1		"	"	26919
3713.2	1		"	"	26923
3712.3	2		"	"	26929
3711.6	1		"	"	26935
3711.0	1		"	"	26939
3709.4	1		"	"	26951
3708.68	4		"	"	26956.2
3708.09	4		"	"	26960.5
3706.2	1b		"	"	26974
3705.5	1		"	"	26979
3705.4	1		"	"	26980
3704.8	1		"	"	26984
3704.4	1		"	"	26987
3703.4	1		"	"	26994
3703.0	1		"	"	26997
3702.9	1		"	"	26998
3702.4	1		"	"	27002
3701.9	1		"	"	27005
3700.7	1n		"	"	27014
3699.5	1		"	"	27023
3698.7	1		"	"	27029
3698.6	1		"	"	27029
3697.5	1		1.02	"	27037

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3696.9	1		1.02	7.6	27042
3696.5	1		"	"	27045
3696.2	1		"	"	27047
3694.70	4		"	"	27058.2
3693.8	1		"	"	27064
3693.6	1n Mo		"	"	27066
3692.8	4		"	"	27072
3692.00	4		"	"	27079.0
3690.3	2		"	"	27090
3689.9	1		"	"	27093
3689.7	2		"	"	27094
3689.2	1		"	"	27098
3688.6	1		"	"	27103
3688.4	2 Mo		"	"	27104
3688.1	2		"	"	27106
3687.4	2n		"	"	27111
3686.7	1		"	"	27117
3686.4	1		"	"	27119
3685.6	1		"	"	27125
3685.5	1		"	"	27125
3685.2	1		"	"	27128
3684.7	1		"	"	27131
3683.9	2		"	"	27137
3683.3	2		"	7.7	27142
3682.22	4		"	"	27149.8
3680.8	1n		"	"	27165
3679.9	1		"	"	27167
3679.3	1		"	"	27171
3677.6	1		"	"	27184
3676.3	1		"	"	27193
3675.5	1		"	"	27199
3674.9	1		"	"	27204
3672.9	1		"	"	27218
3671.9	1n		"	"	27226
3671.5	1n		"	"	27229
3670.6	1n		"	"	27235
3670.2	1n		"	"	27238
3669.3	1		"	"	27245
3668.7	1		"	"	27250
3667.6	1		"	"	27258
3667.5	1		"	"	27259
3667.1	1n		"	"	27262
3665.7	1n		"	"	27272
3664.7	1n		"	"	27279
3663.7	1		"	"	27287
3663.3	1		"	"	27290
3661.6	1		"	"	27302
3661.2	1		"	"	27305
3660.1	1		"	"	27314
3659.2	1		"	"	27320
3658.05	4		"	"	27329.3
3657.75	6		1.01	"	27331.5
3657.5	6		"	"	27333
3656.7	1		"	"	27339
3656.6	1		"	"	27340

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3655.5	1		1.01	7.7	27348
3654.7	1		"	"	27354
3654.2	2		"	"	27358
3653.3	2		"	"	27365
3651.5	1		"	"	27378
3650.0	1		"	"	27389
3649.0	1		"	"	27397
3647.9	1		"	"	27405
3646.72	6		"	"	27414.2
3645.78	6		"	"	27421.3
3644.3	1		"	"	27432
3644.0	1		"	"	27434
3643.6	1		"	"	27437
3643.5	1		"	"	27438
3643.1	1		"	"	27441
3642.8	1		"	"	27443
4641.55	8		"	"	27453.1
3640.1	1		"	"	27464
3640.0	1		"	"	27465
3639.2	1		"	7.8	27471
3638.0	1		"	"	27480
3637.4	1		"	"	27484
3636.8	1		"	"	27489
3635.4	ln		"	"	27499
3635.2	ln Mo		"	"	27501
3633.8	1		"	"	27511
3633.4	1		"	"	27514
3632.7	1		"	"	27520
3631.5	1		"	"	27529
3631.0	1		"	"	27533
3630.9	1		"	"	27533
3630.4	1		"	"	27537
3630.2	1		"	"	27539
3629.1	2		"	"	27547
3626.5	1		"	"	27567
3625.8	1		"	"	27572
3625.5	1		"	"	27574
3625.1	1		"	"	27577
3624.3	1		"	"	27584
3623.6	1		"	"	27589
3623.1	1		"	"	27593
3622.9	1		"	"	27594
3621.4	1		"	"	27606
3620.7	1		"	"	27611
3620.0	1		"	"	27616
3619.6	1		"	"	27619
3619.3	1		"	"	27622
3618.5	1		"	"	27628
3617.72	6		1.00	"	27633.9
3616.9	1		"	"	27640
3616.5	1		"	"	27643
3616.2	1		"	"	27645
3615.6	1		"	"	27650
3615.0	1		"	"	27655
3614.6	1		"	"	27658



TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3613·97	8		1·00	7·8	27662·6
3612·00	4		"	"	27677·7
3611·0	1n		"	"	27685
3610·0	2		"	"	27693
3608·9	1		"	"	27701
3607·6	1n		"	"	27711
3607·3	2		"	"	27714
3606·7	1		"	"	27718
3606·4	1		"	"	27720
3605·6	1		"	"	27727
3605·2	1		"	"	27730
3604·1	1		"	"	27738
3603·9	1		"	"	27740
3603·0	1r		"	"	27747
3601·7	1		"	"	27757
3601·2	1		"	"	27761
3600·6	1n		"	"	27765
3599·0	1		"	"	27777
3597·8	1		"	"	27787
3596·3	1		"	"	27798
3595·6	1		"	"	27804
3595·2	1		"	7·9	27807
3595·0	1		"	"	27808
3594·6	1		"	"	27812
3594·1	1		"	"	27815
3593·6	1		"	"	27819
3592·55	8		"	"	27827·5
3590·9	1		"	"	27840
3590·5	1n		"	"	27843
3589·9	1		"	"	27848
3589·7	1n		"	"	27849
3588·7	1n		"	"	27851
3587·1	1		"	"	27870
3586·3	1n		"	"	27876
3585·8	1n		"	"	27880
3585·3	1n		"	"	27884
3585·0	1		"	"	27886
3584·8	1		"	"	27888
3583·5	2		"	"	27898
3582·8	1		"	"	27903
3582·7	1		"	"	27904
3582·0	2		"	"	27909
3581·2	2		"	"	27916
3579·8	1n		"	"	27927
3578·6	1n		"	"	27936
3577·6	1		0·99	"	27944
3576·0	1		"	"	27956
3575·3	2		"	"	27962
3574·0	1		"	"	27972
3573·5	1		"	"	27976
3572·6	8		"	"	27982·4
3572·2	1		"	"	27986
3571·0	1		"	"	27995
3570·3	2		"	"	28001
3569·8	1		"	"	28005

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3569.7	1		0.99	7.9	28007
3569.3	1		"	"	28009
3569.1	1		"	"	28010
3568.2	2		"	"	28017
3567.6	1		"	"	28022
3565.8	1		"	"	28036
3565.7	1		"	"	28037
3565.5	1		"	"	28039
3564.5	1		"	"	28046
3564.2	1		"	"	28049
3563.6	1		"	"	28054
3562.6	2		"	"	28061
3561.5	2		"	"	28070
3559.8	1		"	"	28083
3559.0	1		"	"	28090
3558.5	1		"	"	28094
3558.4	1		"	"	28095
3557.3	1		"	"	28103
3557.2	1		"	"	28104
3556.1	1		"	"	28113
3555.35	4		"	"	28118.7
3554.6	1		"	"	28125
3554.1	1		"	"	28129
3554.0	1		"	"	28129
3553.0	1		"	"	28137
3552.3	1		"	"	28143
3551.6	1		"	8.0	28148
3551.0	1		"	"	28153
3550.8	1		"	"	28155
3550.2	1		"	"	28159
3549.23	6		"	"	28167.1
3548.3	2		"	"	28175
3546.5	1		"	"	28189
3545.40	4		"	"	28197.6
3544.6	2		"	"	28204
3544.3	1		"	"	28206
3543.3	2		"	"	28214
3542.3	1		"	"	28222
3541.7	1		"	"	28227
3541.3	1n		"	"	28230
3540.8	1		"	"	28234
3540.4	1		"	"	28237
3540.0	1		"	"	28241
3539.5	1		"	"	28245
3538.6	1		"	"	28252
3538.2	1		"	"	28255
3537.5	2		0.98	"	28261
3536.47	4		"	"	28268.8
3535.6	2		"	"	28276
3535.4	1		"	"	28277
3534.5	2		"	"	28285
3532.8	1		"	"	28298
3532.7	1		"	"	28299
3531.4	1		"	"	28309
3531.1	1		"	"	28312

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3530.9	1		0.98	8.0	28313
3530.7	1		"	"	28315
3529.72	4		"	"	28322.9
3528.9	1		"	"	28329
3528.8	1		"	"	28330
3528.1	1		"	"	28336
3527.8	1		"	"	28338
3526.9	2		"	"	28346
3525.7	2		"	"	28355
3524.6	1		"	"	28364
3524.3	1		"	"	28366
3523.6	1		"	"	28372
3523.2	1		"	"	28375
3522.2	1		"	"	28383
3522.1	1		"	"	28384
3521.0	1		"	"	28393
3520.2	1 <sub>n</sub>		"	"	28399
3518.9	1		"	"	28410
3518.6	1		"	"	28412
3517.5	1		"	"	28421
3517.1	1		"	"	28425
3516.3	1		"	"	28431
3516.1	1		"	"	28433
3515.1	1		"	"	28441
3514.3	1		"	"	28447
3513.0	1		"	"	28458
3512.2	2		"	"	28464
3511.8	1		"	"	28467
3511.3	2		"	"	28471
3510.6	1		"	8.1	28477
3510.1	2		"	"	28481
3509.4	2		"	"	28487
3509.1	1		"	"	28489
3508.89	6		"	"	28490.9
3508.0	1		"	"	28498
3507.3	1		"	"	28504
3506.6	1		"	"	28510
3506.3	1 <sub>n</sub>		"	"	28512
3504.9	1		"	"	28523
3504.8	1		"	"	28524
3503.88	4		"	"	28531.7
3503.1	1		"	"	28538
3502.2	1		"	"	28545
3501.4	1 <sub>n</sub>		"	"	28552
3500.3	1		"	"	98561
3499.7	1		"	"	28566
3498.9	1		0.97	"	28572
3498.2	1		"	"	28578
3498.0	1		"	"	28580
3496.9	1		"	"	28589
3496.0	1		"	"	28595.9
3495.40	4		"	"	28601
3493.2	1 <sub>b</sub>		"	"	28619
3492.1	2		"	"	28628
3491.2	2		"	"	28635



TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3490.3	2		0.97	8.1	28643
3489.9	1		"	"	28646
3489.5	1n		"	"	28650
3488.7	1		"	"	28656
3488.6	1		"	"	28657
3487.1	1		"	"	28669
3486.32	4		"	"	28675.4
3485.5	1		"	"	28682
3485.3	1		"	"	28684
3483.5	1		"	"	28699
3482.8	1		"	"	28705
3481.5	1		"	"	28715
3480.6	1		"	"	28723
3480.3	1		"	"	28725
3479.0	1n		"	"	28736
3478.0	2		"	"	28744
3477.2	2		"	"	28751
3476.6	2		"	"	28756
3475.55	4		"	"	28764.3
3475.45	4		"	"	28765.2
3474.2	1n		"	"	28776
3473.0	1		"	"	28786
3472.4	1		"	"	28791
3471.9	1		"	"	28795
3470.5	1n		"	8.2	28806
3470.2	1n		"	"	28809
3469.3	1n		"	"	28816
3468.3	2		"	"	28825
3468.0	1		"	"	28827
3467.6	1		"	"	28830
3467.0	1		"	"	28835
3466.5	1		"	"	28840
3466.0	1		"	"	28844
3465.2	1		"	"	28850
3464.6	2		"	"	28855
3463.70	6		"	"	28862.7
3462.7	1n		"	"	28871
3462.2	1n		"	"	28875
3461.7	1		"	"	28880
3460.3	1		"	"	28891
3459.8	1		"	"	28895
3459.6	1		"	"	28897
3458.8	1		0.96	"	28904
3458.4	1		"	"	28907
3457.8	1		"	"	28912
3456.5	1		"	"	28923
3455.1	2		"	"	28935
3454.0	1		"	"	28944
3452.9	1n		"	"	28953
3452.6	2		"	"	28956
3452.0	1		"	"	28961
3451.9	1		"	"	28962
3451.3	1		"	"	28967
3450.8	1		"	"	28971
3450.3	1		"	"	28975

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3450.00	4		0.96	8.2	28977.3
3449.5	1		"	"	28982
3449.0	1		"	"	28986
3448.4	2		"	"	28991
3448.2	1		"	"	28993
3448.0	1		"	"	28994
3447.0	1		"	"	29003
3446.6	1		"	"	29006
3445.8	1		"	"	29013
3445.6	1		"	"	29015
3445.3	1		"	"	29017
3444.7	1		"	"	29022
3444.2	1		"	"	29026
3443.2	2		"	"	29035
3442.1	1		"	"	29044
3440.80	6 Fe		"	"	29054.8
3438.8	1		"	"	29072
3438.2	1		"	"	29077
3435.7	2		"	"	29098
3434.8	1		"	"	29106
3433.9	1		"	"	29113
3432.6	1n		"	8.3	29124
3432.3	1n		"	"	29127
3431.7	1n		"	"	29132
3430.8	2n		"	"	29140
3430.4	1		"	"	29143
3429.7	2		"	"	22149
3429.4	1		"	"	29152
3427.8	2		"	"	29165
3426.3	1		"	"	29178
3426.0	1		"	"	29181
3425.6	1		"	"	29184
3424.9	1n		"	"	29190
3424.6	2		"	"	29192
3423.3	1		"	"	29204
3422.8	1		"	"	29208
3421.4	1		"	"	29220
3420.2	2		"	"	29230
3419.3	1		"	"	29238
3418.6	1		"	"	29244
3418.4	1		"	"	29245
3417.7	1		0.95	"	29251
3417.6	1		"	"	29252
3416.78	4		"	"	29259.0
3415.4	2n		"	"	29271
3414.7	1		"	"	29277
3413.6	2		"	"	29287
3412.8	2		"	"	29293
3412.0	1n		"	"	29300
3411.0	1		"	"	29309
3409.3	1n		"	"	29324
3407.6	2		"	"	29338
3406.9	2		"	"	29344
3406.7	2		"	"	29346
3406.2	1		"	"	29350

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3406.1	1		0.95	8.3	29351
3405.3	1		"	"	29358
3404.8	1		"	"	29362
3404.3	1		"	"	29367
3404.2	1		"	"	29367
3403.8	1		"	"	29371
3402.8	1		"	"	29380
3402.2	1		"	"	29385
3402.03	6		"	"	29385.9
3401.5	1		"	"	29391
3401.0	1		"	"	29395
3400.7	1		"	"	29398
3400.2	1		"	"	29402
3399.07	6		"	"	29411.5
3398.3	2		"	"	29418
3397.7	1		"	"	29424
3397.4	1		"	"	29426
3396.5	1		"	8.4	29434
3396.0	1		"	"	29438
3395.0	1		"	"	29447
3394.6	2		"	"	29451
3393.7	1n		"	"	29458
3393.1	1		"	"	29464
3392.5	1		"	"	29469
3391.7	1		"	"	29476
3391.3	1		"	"	29479
3390.5	2n		"	"	29486
3389.7	1		"	"	29493
3389.0	2		"	"	29499
3387.8	2		"	"	29510
3387.0	1		"	"	29517
3386.7	1		"	"	29519
3386.2	1		"	"	29524
3386.0	1		"	"	29525
3385.1	1		"	"	29534
3384.5	1		"	"	29538
3384.4	1		"	"	29539
3384.0	1		"	"	29543
3383.3	2		"	"	29549
3382.4	1		"	"	29557
3382.0	1		"	"	29560
3381.2	2		"	"	29567
3379.8	1		"	"	29580
3379.3	2		"	"	29584
3378.7	1		"	"	29589
3378.4	1		"	"	29592
3378.3	1		"	"	29593
3377.5	1		0.94	"	29600
3377.0	1		"	"	29604
3376.23	8		"	"	29610.4
3375.3	1		"	"	29619
3374.3	1		"	"	29628
3373.4	1		"	"	29636
3373.0	1		"	"	29639
3372.4	2		"	"	29644



TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3371.7	1		0.94	8.4	29651
3371.3	1		"	"	29654
3370.7	1		"	"	29659
3370.4	1		"	"	29662
3370.0	1		"	"	29666
3369.9	1		"	"	29666
3369.2	1		"	"	29673
3368.3	1n		"	"	29681
3367.8	1		"	"	29685
3367.5	1		"	"	29688
3366.8	2		"	"	29694
3366.5	1		"	"	29696
3366.0	1		"	"	29701
3365.3	1		"	"	29707
3364.9	1		"	"	29711
3364.0	2		"	"	29719
3363.5	2		"	"	29723
3362.5	1		"	"	29732
3362.1	1		"	"	29735
3361.20	4		"	"	29742.9
3360.5	2		"	8.5	29748
3359.3	1		"	"	29759
3358.72	6		"	"	29764.8
3357.8	1		"	"	29772
3357.2	1		"	"	29778
3356.5	1b		"	"	29784
3355.9	1		"	"	29789
3355.5	1		"	"	29793
3355.1	1		"	"	29796
3354.7	2		"	"	29800
3354.2	1		"	"	29804
3354.0	1		"	"	29806
3353.8	1		"	"	29808
3353.1	2		"	"	29814
3352.5	2		"	"	29819
3352.0	1		"	"	29824
3351.6	1n		"	"	29828
3350.2	1		"	"	29840
3349.6	1		"	"	29845
3349.4	2		"	"	29847
3349.0	2		"	"	29851
3348.4	2		"	"	29856
3347.8	1		"	"	29861
3347.2	1		"	"	29867
3346.2	1		"	"	29876
3345.8	2		"	"	29879
3345.6	1		"	"	29881
3344.5	1		"	"	29891
3343.60	4		"	"	29899.4
3343.28	4		"	"	29902.2
3342.63	6		"	"	29908.1
3341.3	1		"	"	29919
3340.3	1		"	"	29928
3339.7	1		"	"	29934
3339.1	2		"	"	29939

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3338.7	2		0.93	8.5	29943
3338.3	1		"	"	29946
3338.0	1n		"	"	29949
3336.7	2		"	"	29961
3336.1	1		"	"	29966
3335.6	1		"	"	29971
3334.8	1		"	"	29978
3334.0	1		"	"	29985
3331.7	2		"	"	30006
3330.8	1n		"	"	30014
3328.2	1		"	"	30037
3327.8	1		"	"	30041
3327.2	1		"	"	30046
3326.3	2		"	"	30054
3326.2	1		"	"	30055
3325.7	1		"	"	30060
3325.0	1		"	8.6	30066
3324.2	1		"	"	30073
3323.5	1		"	"	30080
3322.6	1		"	"	30088
3321.7	1		"	"	30096
3321.2	1		"	"	30101
3321.1	1		"	"	30102
3320.5	1		"	"	30107
3320.4	1		"	"	30108
3319.6	1		"	"	30115
3318.7	1		"	"	30123
3318.5	1		"	"	30125
3318.0	1		"	"	30130
3317.0	1		"	"	30139
3316.1	1		"	"	30147
3315.2	1		"	"	30155
3314.4	1		"	"	30162
3313.6	1		"	"	30170
3312.4	1		"	"	30181
3311.6	2		"	"	30188
3310.3	2		"	"	30200
3309.6	1		"	"	30206
3309.2	1		"	"	30210
3308.3	2		"	"	30218
3306.2	4n Fe		"	"	30237
3305.5	1		"	"	30244
3304.6	2		"	"	30252
3304.5	1		"	"	30253
3303.8	1		"	"	30259
3303.3	1		"	"	30264
3303.0	1		"	"	30267
3302.0	1		"	"	30276
3301.3	1		"	"	30282
3301.0	2		"	"	30285
3300.5	1		"	"	30289
3299.7	1		0.92	"	30297
3298.8	1		"	"	30305
3298.3	2		"	"	30310
3297.5	2		"	"	30317

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3296.3	1		0.92	8.6	30328
3295.2	1		"	"	30338
3294.3	1n		"	"	30346
3293.8	2		"	"	30351
3293.0	1		"	"	30358
3291.7	1		"	"	30370
3291.5	1		"	"	30372
3291.1	1		"	"	30376
3291.0	1		"	"	30377
3290.6	1		"	"	30381
3290.3	1		"	"	30383
3290.1	1n		"	"	30385
3288.8	1n		"	8.7	30397
3288.0	1n		"	"	30405
3286.70	4		"	"	30417.0
3285.8	2n		"	"	30425
3283.7	2n		"	"	30444
3282.7	1n		"	"	30454
3282.0	2		"	"	30460
3280.2	1n		"	"	30477
3279.5	1n		"	"	30483
3277.8	1		"	"	30499
3277.6	1n		"	"	30501
3277.0	1		"	"	30507
3276.5	1n		"	"	30511
3275.7	1n		"	"	30519
3274.9	1n		"	"	30526
3273.2	1n		"	"	30542
3272.0	1		"	"	30553
3271.7	1n		"	"	30555
3270.3	1		"	"	30569
3270.2	1		"	"	30570
3269.7	1		"	"	30575
3269.0	1		"	"	30581
3268.6	1		"	"	30585
3268.3	2		"	"	30588
3267.6	2		"	"	30595
3266.7	2		"	"	30603
3266.0	2		"	"	30609
3265.2	2		"	"	30617
3264.2	1		"	"	30626
3263.2	1		"	"	30636
3262.37	4		"	"	30643.9
3261.2	1		"	"	30655
3260.8	1		"	"	30658
3260.3	1		"	"	30663
3259.4	1		0.91	"	30671
3257.8	1		"	"	30687
3256.1	1		"	"	30703
3255.7	1		"	"	30706
3255.0	2		"	"	30713
3254.3	2		"	"	30720
3252.5	1n		"	8.8	30737
3251.2	2		"	"	30749
3250.2	1		"	"	30758



## TUNGSTEN (SPARK SPECTRUM) —continued.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3248.7	1		0.91	8.8	30773
3247.9	1		"	"	30780
3247.6	1		"	"	30783
3246.4	1		"	"	30794
3245.4	1		"	"	30804
3243.50	4		"	"	30822.1
3243.2	2		"	"	30825
3242.1	2		"	"	30835
3241.4	1		"	"	30842
3241.2	1		"	"	30844
3240.0	1n		"	"	30855
3238.9	1		"	"	30866
3238.5	1		"	"	30869
3238.3	1		"	"	30871
3237.2	1		"	"	30882
3236.0	1		"	"	30893
3235.9	1		"	"	30894
3235.1	1		"	"	30902
3234.6	1		"	"	30907
3233.8	1		"	"	30914
3233.3	2		"	"	30919
3232.6	1		"	"	30926
3232.2	1		"	"	30930
3231.6	1		"	"	30935
3230.9	1		"	"	30942
3229.7	1		"	"	30954
3229.5	1		"	"	30956
3229.0	1		"	"	30960
3227.9	1		"	"	30971
3227.7	1		"	"	30973
3226.7	2		"	"	30982
3224.9	1		"	"	31000
3224.0	1		"	"	31008
3223.3	1n		"	"	31015
3222.7	1		"	"	31021
3222.1	1		"	"	31027
3221.3	2		"	"	31034
3221.1	1n		"	"	31036
3220.2	1		0.90	"	31045
3220.0	1		"	"	31047
3218.9	1		"	"	31058
3218.7	1		"	"	31059
3217.6	1		"	"	31070
3216.3	2		"	8.9	31083
3215.68	4		"	"	31088.7
3215.3	2		"	"	31092
3214.4	1		"	"	31101
3214.1	1		"	"	31104
3213.4	1		"	"	31111
3213.2	1		"	"	31113
3212.1	1		"	"	31123
3211.9	1		"	"	31125
3211.2	1		"	"	31132
3210.9	1		"	"	31135
3210.7	1		"	"	31137

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Angström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3210.0	2		0.90	8.9	31144
3208.6	1		"	"	31157
3208.3	1		"	"	31160
3208.2	1		"	"	31161
3207.8	1		"	"	31165
3207.6	1		"	"	31167
3207.3	2		"	"	31170
3206.7	1		"	"	31176
3206.4	2		"	"	31179
3205.7	1		"	"	31185
3205.6	1		"	"	31186
3205.3	1		"	"	31189
3204.5	1		"	"	31197
3203.7	1		"	"	31205
3203.43	4		"	"	31207.6
3202.2	1		"	"	31220
3202.0	1		"	"	31221
3201.7	2		"	"	31224
3200.5	1n		"	"	31236
3200.1	1		"	"	31240
3199.4	1		"	"	31247
3199.0	2		"	"	31251
3198.4	2		"	"	31257
3197.5	2		"	"	31265
3196.5	1		"	"	31275
3196.0	1		"	"	31280
3195.8	1		"	"	31282
3194.7	2b		"	"	31293
3193.8	2		"	"	31302
3193.2	1		"	"	31308
3193.0	1		"	"	31310
3192.3	1		"	"	31316
3192.2	1		"	"	31317
3191.6	2		"	"	31323
3191.0	2		"	"	31329
3189.3	2		"	"	31346
3188.5	1		"	"	31354
3188.0	1		"	"	31359
3187.8	1		"	"	31361
3187.1	2		"	"	31367
3186.4	1		"	"	31374
3185.0	1		"	"	31388
3184.4	1		"	"	31394
3184.0	1		"	"	31398
3183.5	1		"	"	31403
3182.8	1		"	"	31410
3182.2	1		"	"	31416
3181.8	1		0.89	"	31420
3180.8	1		"	9.0	31430
3180.2	1		"	"	31436
3179.60	4n		"	"	31441.5
3178.7	1n		"	"	31450
3178.1	2		"	"	31456
3177.2	2		"	"	31465
3176.7	1		"	"	31470
1898.					

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
3176.10	4		0.89	9.0	31476.2
3175.1	1		"	"	31486
3174.7	1		"	"	31490
3173.6	1		"	"	31501
3172.8	1		"	"	31509
3171.6	1		"	"	31521
3171.4	1		"	"	31523
3170.2	1		"	"	31535
3170.0	1		"	"	31537
3168.5	ln		"	"	31552
3167.9	1		"	"	31558
3167.7	1		"	"	31560
3167.0	1		"	"	31567
3166.5	ln		"	"	31572
3165.7	1		"	"	31580
3165.4	1		"	"	31583
3164.8	1		"	"	31589
3164.5	1		"	"	31592
3164.4	1		"	"	31593
3163.5	2		"	"	31602
3162.2	1		"	"	31615
3162.0	1		"	"	31617
3161.3	1		"	"	31624
3160.7	1		"	"	31630
3160.20	4		"	"	31634.6
3159.0	4b		"	"	31647
3157.0	ln		"	"	31667
3155.7	1		"	"	31680
3155.5	1		"	"	31682
3155.2	1		"	"	31685
3154.2	1		"	"	31695
3152.8	1		"	"	31709
3152.4	2		"	"	31713
3151.6	1		"	"	31721
3151.3	2		"	"	31724
3149.9	2		"	"	31738
3149.8	1		"	"	31739
3148.1	1		"	"	31756
3147.9	1		"	"	31758
3146.8	1		"	9.1	31769
3146.3	2		"	"	31774
3145.7	2		"	"	31780
3145.5	1		"	"	31782
3144.5	2		"	"	31793
3143.3	2		"	"	31805
3143.0	1		"	"	31808
3142.9	1		"	"	31809
3142.0	4		"	"	31818
3141.3	2		0.88	"	31825
3140.3	1		"	"	31835
3140.2	1		"	"	31836
3139.4	1		"	"	31844
3138.7	1		"	"	31851
3137.9	1		"	"	31859
3137.6	1		"	"	31862

## TUNGSTEN (SPARK SPECTRUM) --continued.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3137.2	1		0.88	9.1	31867
3135.9	1		"	"	31880
3135.8	1		"	"	31881
3133.8	2		"	"	31901
3132.6	1		"	"	31913
3131.2	1		"	"	31928
3130.4	1		"	"	31936
3129.7	2		"	"	31943
3129.0	2		"	"	31950
3127.7	2		"	"	31963
3127.3	1		"	"	31967
3126.3	2		"	"	31978
3125.7	1		"	"	31984
3125.3	1		"	"	31988
3124.5	1n		"	"	31996
3123.5	2		"	"	32006
3121.9	1n Mo		"	"	32023
3121.0	1		"	"	32032
3120.7	1		"	"	32035
3120.1	2		"	"	32041
3119.6	1		"	"	32046
3119.4	1		"	"	32048
3118.3	1		"	"	32060
3117.5	2		"	"	32068
3116.0	1n		"	"	32083
3115.4	1		"	"	32090
3115.3	1		"	"	32091
3113.6	1		"	"	32108
3113.3	1		"	9.2	32111
3112.7	2		"	"	32117
3112.4	1		"	"	32121
3112.3	1		"	"	32122
3111.8	1		"	"	32127
3111.1	2		"	"	32134
3110.6	2		"	"	32139
3108.6	2		"	"	32160
3108.3	1		"	"	32163
3107.9	2		"	"	32167
3107.5	1		"	"	32171
3107.2	2		"	"	32174
3106.5	2		"	"	32185
3106.1	1		"	"	32186
3105.9	1		"	"	32188
3104.9	1		"	"	32198
3104.3	1		"	"	32204
3103.7	1		"	"	32211
3103.4	1		"	"	32214
3103.0	1n		"	"	32218
3102.2	2		"	"	32226
3101.2	1		0.87	"	32237
3100.7	2		"	"	32242
3100.2	1n		"	"	32247
3099.0	1		"	"	32259
3098.7	1		"	"	32263
3098.4	1		"	"	32266



TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3096.5	1		0.87	9.2	32286
3096.0	2				32291
3095.3	1		"	"	32298
3095.0	1		"	"	32301
3094.7	1		"	"	32304
3094.0	1		"	"	32312
3093.6	2		"	"	32316
3093.3	1		"	"	32319
3092.3	1		"	"	32329
3091.9	1		"	"	32334
3091.7	1		"	"	32336
3091.2	1		"	"	32341
3090.7	1		"	"	32346
3090.5	1		"	"	32348
3089.2	1		"	"	32362
3089.1	1		"	"	32363
3088.3	1		"	"	32371
3088.1	1		"	"	32373
3087.5	2		"	"	32380
3086.4	2		"	"	32391
3085.4	1		"	"	32402
3085.0	2		"	"	32406
3084.4	1		"	"	32412
3083.6	2		"	9.3	32421
3083.2	1		"	"	32425
3082.2	2		"	"	32435
3081.9	2		"	"	32439
3081.1	2		"	"	32447
3080.7	1		"	"	32451
3080.0	1		"	"	32459
3079.3	1		"	"	32466
3079.0	1		"	"	32469
3078.3	1		"	"	32476
3077.63	6		"	"	32483.2
3076.9	1		"	"	32491
3076.0	2		"	"	32501
3075.3	1n		"	"	32508
3074.0	2		"	"	32522
3073.3	2		"	"	32529
3072.7	2		"	"	32536
3071.8	2		"	"	32545
3071.3	2		"	"	32551
3069.3	2		"	"	32572
3068.6	1		"	"	32579
3068.2	1		"	"	32583
3067.9	2		"	"	32587
3067.6	2		"	"	32590
3067.0	2		"	"	32596
3065.1	1		"	"	32616
3065.0	1		"	"	32617
3064.1	2		"	"	32627
3063.3	1		"	"	32636
3063.0	1		"	"	32639
3062.8	1		0.86	"	32641
3061.7	2		"	"	32653

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3061.0	1		0.86	9.3	32660
3059.8	1		"	"	32673
3059.7	1		"	"	32674
3059.1	1		"	"	32680
3058.5	2		"	"	32687
3057.5	1		"	"	32697
3056.2	1n		"	"	32711
3055.7	1		"	"	32717
3055.5	1		"	"	32719
3055.1	1		"	"	32723
3055.0	1		"	"	32724
3054.1	1		"	9.4	32734
3053.5	2		"	"	32740
3051.8	1		"	"	32759
3051.42	4		"	"	32762.2
3050.6	1		"	"	32771
3050.0	2		"	"	32778
3049.8	2		"	"	32780
3049.0	1		"	"	32789
3048.6	2		"	"	32793
3047.6	2		"	"	32804
3047.1	2		"	"	32809
3046.5	2		"	"	32816
3045.6	1		"	"	32825
3045.2	1		"	"	32830
3044.4	1		"	"	32838
3043.7	2		"	"	32846
3042.2	1n		"	"	32862
3041.8	2		"	"	32866
3041.0	1n		"	"	32875
3040.3	1		"	"	32882
3039.6	2		"	"	32890
3039.3	2		"	"	32893
3038.7	1		"	"	32900
3038.0	1		"	"	32907
3037.7	1		"	"	32911
3037.4	1		"	"	32914
3036.7	2		"	"	32921
3035.4	1		"	"	32936
3035.2	1		"	"	32938
3034.2	1		"	"	32949
3033.9	1		"	"	32952
3033.7	2		"	"	32954
3032.5	2		"	"	32967
3032.0	2n		"	"	32973
3031.0	2		"	"	32983
3030.3	1		"	"	32991
3029.9	1		"	"	32995
3029.5	1		"	"	33000
3028.9	1		"	"	33006
3028.7	1		"	"	33008
3027.8	1		"	"	33018
3027.3	1		"	"	33024
3026.7	2		"	"	33030
3025.9	1		"	"	33039

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
3025.2	1		0.86	9.5	33047
3024.9	1		"	"	33050
3024.58	4		"	"	33052.9
3023.6	1		"	"	33063
3022.9	1		0.85	"	33071
3022.7	1		"	"	33073
3022.6	1		"	"	33074
3021.7	1n		"	"	33084
3021.0	1		"	"	33092
3020.7	2		"	"	33095
3020.3	1n		"	"	33099
3019.6	1		"	"	33107
3019.4	1		"	"	33109
3018.6	2		"	"	33118
3017.9	1		"	"	33126
3017.4	2		"	"	33131
3017.1	1		"	"	33134
3015.6	1		"	"	33151
3014.9	1		"	"	33159
3014.6	1		"	"	33162
3013.7	1		"	"	33172
3013.2	1		"	"	33177
3012.1	1		"	"	33189
3011.7	1		"	"	33194
3011.2	1		"	"	33199
3011.0	1		"	"	33202
3010.7	2		"	"	33205
3009.6	1		"	"	33217
3008.8	2		"	"	33226
3008.0	1		"	"	33235
3006.5	1		"	"	33251
3006.3	1		"	"	33253
3005.3	1		"	"	33265
3004.8	1		"	"	33270
3004.2	1		"	"	33277
3004.0	1		"	"	33279
3003.7	1		"	"	33282
3003.0	1		"	"	33290
3002.8	1		"	"	33292
3002.2	2		"	"	33299
3001.9	1		"	"	33302
3000.9	1		"	"	33313
3000.6	2		"	"	33317
3000.3	1		"	"	33320
2999.6	1		"	"	33328
2998.7	2		"	"	33338
2998.0	1		"	"	33346
2997.7	1		"	"	33349
2997.6	1		"	9.6	33350
2996.9	1		"	"	33358
2996.5	1		"	"	33362
2996.0	1		"	"	33368
2995.7	1		"	"	33371
2995.4	1		"	"	33375
2995.3	2		"	"	33376

TUNGSTEN (SPARK SPECTRUM)— *continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2994·8	2		0·85	9·6	33381
2994·7	1		"	"	33382
2993·6	2		"	"	33395
2992·9	1		"	"	33402
2992·0	2		"	"	33412
2991·5	1		"	"	33418
2990·7	1		"	"	33427
2989·5	1		"	"	33440
2988·8	1		"	"	33448
2988·6	1		"	"	33450
2987·3	2		"	"	33465
2986·4	1		"	"	33475
2986·1	1		"	"	33478
2985·9	1		"	"	33481
2984·9	1		"	"	33492
2984·5	1		"	"	33496
2984·2	1		"	"	33500
2983·6	1		"	"	33507
2983·2	1		"	"	33511
2982·6	1		0·84	"	33518
2982·3	2		"	"	33521
2981·6	1		"	"	33529
2980·7	1n		"	"	33539
2979·9	2		"	"	33548
2979·2	1		"	"	33556
2978·3	1		"	"	33566
2978·0	1		"	"	33570
2977·6	2		"	"	33574
2977·2	2		"	"	33579
2976·9	1		"	"	33582
2976·5	2		"	"	33587
2975·7	1n		"	"	33596
2975·1	1		"	"	33602
2974·4	2		"	"	33610
2973·3	1		"	"	33623
2973·1	1		"	"	33625
2972·9	1		"	"	33627
2972·5	1		"	"	33632
2971·7	1		"	"	33641
2971·4	1		"	"	33644
2971·0	1		"	9·7	33649
2970·4	1		"	"	33655
2970·0	1		"	"	33660
2969·8	1		"	"	33662
2969·1	1		"	"	33670
2969·0	1		"	"	33671
2968·0	2		"	"	33683
2967·1	1		"	"	33693
2967·0	1		"	"	33694
2966·7	1		"	"	33697
2966·2	1		"	"	33703
2965·6	1		"	"	33710
2965·0	1		"	"	33717
2964·5	2		"	"	33722
2962·6	1		"	"	33744



TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2961·8	1		0·84	9·7	33753
2961·0	2		"	"	33762
2960·3	1		"	"	33770
2960·1	1		"	"	33773
2960·0	1		"	"	33774
2959·0	1n		"	"	33785
2958·0	1		"	"	33797
2957·4	1		"	"	33803
2957·3	1		"	"	33805
2956·8	1		"	"	33810
2956·5	1		"	"	33814
2955·3	1		"	"	33828
2955·0	2		"	"	33831
2954·0	1		"	"	33842
2953·9	1		"	"	33844
2953·0	1		"	"	33854
2952·3	4		"	"	33862
2951·0	1		"	"	33877
2950·5	2		"	"	33883
2949·2	1		"	"	33898
2948·5	1		"	"	33906
2948·3	1		"	"	33908
2947·8	1n		"	"	33914
2947·5	1		"	"	33917
2947·0	2		"	"	33923
2946·0	1n		"	"	33934
2945·3	1		"	9·8	33942
2944·6	2		"	"	33950
2943·5	1		"	"	33963
2943·2	1		"	"	33967
2942·7	1		0·83	"	33972
2942·3	1		"	"	33977
2941·6	1		"	"	33985
2941·4	1		"	"	33987
2941·1	1		"	"	33991
2940·8	1		"	"	33994
2940·3	2		"	"	34000
2939·0	2n		"	"	34015
2937·7	1		"	"	34030
2937·2	1		"	"	34036
2936·7	2		"	"	34042
2935·7	1		"	"	34053
2935·3	1		"	"	34058
2935·0	2		"	"	34062
2933·0	1		"	"	34085
2932·7	1		"	"	34088
2932·0	1		"	"	34096
2931·6	1		"	"	34101
2931·0	1		"	"	34108
2930·0	2		"	"	34120
2929·1	1		"	"	34130
2928·7	1		"	"	34135
2928·2	1		"	"	34141
2928·0	1		"	"	34143
2927·9	1		"	"	34144

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2927·1	1		0·83	9·8	34154
2927·0	1		"	"	34155
2925·9	2		"	"	34168
2925·1	2		"	"	34177
2924·1	1		"	"	34189
2923·6	2		"	"	34194
2923·2	1		"	"	34199
2922·0	1		"	"	34213
2921·2	1		"	9·9	34223
2921·1	1		"	"	34224
2919·6	1		"	"	34241
2919·1	1		"	"	34247
2918·7	2		"	"	34252
2918·3	1		"	"	34257
2917·7	1n		"	"	34264
2917·0	1n		"	"	34272
2916·7	1		"	"	34275
2915·6	1		"	"	34288
2915·2	1		"	"	34293
2914·7	1		"	"	34299
2914·4	1		"	"	34302
2913·7	1		"	"	34311
2912·6	2		"	"	34324
2912·3	1		"	"	34327
2911·7	2		"	"	34333
2910·5	2		"	"	34358
2909·3	1		"	"	34363
2908·6	2		"	"	34371
2908·3	1		"	"	34374
2907·6	1		"	"	34383
2907·4	1		"	"	34385
2906·5	2		"	"	34396
2905·7	1		"	"	34405
2905·3	1		"	"	34410
2905·0	1		"	"	34413
2904·7	1		"	"	34417
2904·3	2		"	"	34422
2903·7	2		0·82	"	34429
2902·7	1		"	"	34441
2902·3	1		"	"	34445
2901·8	1		"	"	34451
2901·3	2		"	"	34457
2901·0	1		"	"	34461
2900·2	1		"	"	34470
2899·0	1		"	"	34485
2898·7	1		"	"	34488
2898·4	1		"	"	34492
2897·7	1		"	"	34500
2897·3	1		"	"	34505
2896·5	2		"	10·0	34514
2896·1	2		"	"	34519
2895·0	1		"	"	34532
2894·3	1		"	"	34541
2893·8	1		"	"	34547
2893·6	1		"	"	34549

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2893·1	1		0·82	10·0	34555
2893·0	1		"	"	34556
2892·6	1		"	"	34561
2892·2	1		"	"	34566
2891·6	1		"	"	34573
2891·1	1		"	"	34579
2890·7	1		"	"	34584
2889·9	2		"	"	34593
2889·5	1		"	"	34598
2888·8	1		"	"	34606
2888·4	1		"	"	34611
2887·7	1		"	"	34620
2887·0	2		"	"	34628
2886·5	1		"	"	34634
2885·8	1		"	"	34642
2885·6	1		"	"	34645
2885·0	1		"	"	34652
2884·3	2		"	"	34660
2883·3	1		"	"	34672
2882·5	2		"	"	34682
2881·7	2		"	"	34692
2880·8	1		"	"	34703
2880·3	1		"	"	34709
2879·6	1		"	"	34717
2879·3	1 Mo		"	"	34721
2878·4	1		"	"	34732
2878·3	1		"	"	34733
2877·1	1		"	"	34747
2876·3	1		"	"	34757
2876·1	1		"	"	34759
2875·6	1		"	"	34765
2875·3	1		"	"	34769
2874·7	1		"	"	34776
2874·0	1		"	"	34785
2873·5	1		"	"	34791
2872·8	1		"	10·1	34799
2872·0	1		"	"	34809
2871·5	1		"	"	34815
2871·0	1		"	"	34821
2870·8	1		"	"	34823
2869·7	1		"	"	34837
2868·7	2		"	"	34849
2868·0	1		"	"	34857
2867·8	1		"	"	34860
2867·5	1		"	"	34864
2866·8	1		"	"	34872
2866·7	1		"	"	34873
2866·5	1		"	"	34876
2866·2	1		"	"	34879
2865·9	1		"	"	34883
2865·5	1		"	"	34888
2865·0	1		"	"	34894
2864·7	1		0·81	"	34898
2864·2	1		"	"	34904
2863·7	1		"	"	34910

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
2863.3	1		0.81	10.1	34915
2862.6	1		"	"	34923
2862.3	1		"	"	34927
2861.6	1		"	"	34935
2861.3	1		"	"	34939
2861.1	1		"	"	34942
2860.3	1		"	"	34951
2859.6	1		"	"	34960
2858.7	1		"	"	34971
2858.5	1		"	"	34973
2858.2	1		"	"	34977
2857.8	1		"	"	34982
2857.7	1		"	"	34983
2857.3	1		"	"	34988
2856.2	2		"	"	35002
2855.6	2		"	"	35009
2854.9	1		"	"	35017
2854.6	1		"	"	35021
2853.6	2		"	"	35033
2852.3	2		"	"	35049
2851.1	1		"	"	35064
2850.9	1		"	"	35067
2849.7	1		"	"	35081
2848.3	1		"	10.2	35099
2848.2	1		"	"	35100
2848.0	1		"	"	35102
2847.4	1		"	"	35110
2847.3	2		"	"	35111
2846.3	1		"	"	35123
2845.8	1		"	"	35130
2845.1	1		"	"	35138
2844.7	1		"	"	35143
2843.9	ln		"	"	35153
2842.8	1		"	"	35167
2842.7	1		"	"	35168
2841.7	2		"	"	35180
2841.2	1		"	"	35186
2840.8	1		"	"	35191
2840.0	2		"	"	35201
2839.0	1		"	"	35214
2838.6	ln		"	"	35219
2837.9	1		"	"	35227
2837.5	1		"	"	35232
2837.0	1		"	"	35238
2836.3	1		"	"	35247
2835.8	1		"	"	35253
2835.3	ln		"	"	35260
2834.3	2		"	"	35272
2833.7	2		"	"	35280
2833.3	1		"	"	35285
2833.2	1		"	"	35286
2832.6	1		"	"	35293
2832.0	1		"	"	35301
2831.4	2		"	"	35308
2830.2	2		"	"	35323



TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2830.0	1		0.81	10.2	35326
2828.7	1n		"	"	35342
2827.5	2		"	"	35357
2826.6	2		"	"	35368
2825.3	1		"	"	35384
2825.0	1n		"	"	35388
2824.3	1n		0.80	"	35397
2823.9	1n		"	10.3	35402
2822.6	2		"	"	35418
2821.7	1		"	"	35430
2820.7	2		"	"	35442
2820.0	2		"	"	35451
2819.2	2		"	"	35464
2818.2	2		"	"	35474
2817.5	1n		"	"	35482
2816.3	2		"	"	35498
2815.5	1		"	"	35508
2814.9	2		"	"	35515
2814.3	1n		"	"	35523
2813.3	2		"	"	35535
2812.3	2		"	"	35548
2810.0	2		"	"	35577
2809.0	2		"	"	35590
2808.0	1		"	"	35603
2807.9	1 Mo		"	"	35604
2806.7	1		"	"	35619
2806.1	2		"	"	35627
2805.7	1		"	"	35632
2805.2	1		"	"	35638
2804.9	1		"	"	35642
2804.7	1		"	"	35644
2804.3	1		"	"	35650
2804.0	1		"	"	35653
2803.7	2		"	"	35657
2803.3	1		"	"	35662
2803.1	1		"	"	35665
2802.7	1		"	"	35670
2802.5	1		"	"	35672
2802.2	1		"	"	35676
2801.6	1		"	"	35684
2801.3	2		"	"	35688
2800.2	1		"	"	35702
2799.22	4		"	10.4	35713.8
2798.5	1n		"	"	35723
2797.6	1n		"	"	35735
2797.1	1n		"	"	35741
2796.3	1		"	"	35752
2795.7	2		"	"	35759
2793.8	1		"	"	35784
2793.2	1		"	"	35791
2792.8	1		"	"	35796
2792.0	1		"	"	35807
2791.9	1		"	"	35808
2790.6	2		"	"	35825
2790.3	1		"	"	35828

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuum
			$\lambda +$	$\frac{1}{\lambda}$	
2789·3	2		0·80	10·4	35841
2788·7	1		"	"	35849
2788·2	1		"	"	35855
2786·5	2		"	"	35877
2785·8	2		"	"	35886
2785·3	1		"	"	35893
2784·4	1		"	"	35904
2784·2	1		"	"	35907
2783·9	1		0·79	"	35911
2783·3	1		"	"	35919
2782·7	1		"	"	35926
2782·3	2		"	"	35931
2780·5	2		"	"	35955
2779·5	1		"	"	35968
2778·8	2		"	"	35977
2778·1	1		"	"	35986
2777·7	1		"	"	35991
2776·7	2		"	"	36004
2775·2	1		"	10·5	36022
2774·7	2		"	"	36029
2774·2	1		"	"	36035
2772·8	1		"	"	36054
2771·2	1		"	"	36074
2770·7	1		"	"	36081
2770·2	1		"	"	36087
2770·0	1		"	"	36090
2769·2	1		"	"	36101
2768·5	2		"	"	36110
2768·2	1		"	"	36114
2767·7	1		"	"	36120
2767·2	2		"	"	36127
2766·5	2		"	"	36136
2765·5	1		"	"	36149
2765·0	2		"	"	36155
2764·40	4		"	"	36163·7
2762·7	1n		"	"	36185
2761·6	2		"	"	36200
2760·8	1		"	"	36210
2760·6	1		"	"	36213
2759·6	1		"	"	36226
2759·5	1		"	"	36227
2757·9	1		"	"	36248
2757·3	1		"	"	36256
2756·8	1		"	"	36263
2755·1	1		"	"	36285
2753·3	2		"	"	36309
2753·2	1		"	"	36310
2751·6	1		"	"	36331
2750·8	1		"	10·6	36342
2750·4	1		"	"	36347
2750·2	1		"	"	36350
2749·4*	2		"	"	36361
2749·0	1		"	"	36366

\* Double.

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Angström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2748.4	2		0.79	10.6	36374
2747.0	1		"	"	36392
2746.9	1		"	"	36394
2746.5	2		"	"	36399
2745.1	1		"	"	36418
2743.3	1		"	"	36441
2743.2	1		"	"	36443
2743.0	2		"	"	36445
2742.6	2		"	"	36451
2742.1	1		"	"	36457
2741.3	1		0.78	"	36468
2741.0	2		"	"	36472
2740.3	1		"	"	36481
2739.7	2n		"	"	36489
2738.6	1n		"	"	36504
2737.9	1n		"	"	36513
2737.0	1		"	"	36525
2736.7	1		"	"	36529
2735.9	1n		"	"	36540
2734.8	2		"	"	36555
2733.4	1		"	"	36573
2732.0	1		"	"	36592
2731.2	1n		"	"	36603
2730.9	1n		"	"	36607
2730.0	1		"	"	36619
2729.3	1		"	"	36628
2729.0	1		"	"	36632
2728.5	1		"	"	36639
2728.1	1n		"	"	36645
2727.7	1		"	"	36650
2726.7	2		"	10.7	36663
2725.5	1		"	"	36680
2725.2	1		"	"	36684
2724.5	1		"	"	36693
2722.8	2		"	"	36716
2721.7	1		"	"	36731
2720.6	2n		"	"	36746
2719.9	1		"	"	36755
2719.0	1		"	"	36767
2718.1	2		"	"	36779
2717.2	1		"	"	36792
2716.9	1		"	"	36796
2716.4	2		"	"	36802
2715.4	2		"	"	36816
2714.5	1n		"	"	36828
2714.0	1		"	"	36835
2713.5	1n		"	"	36842
2712.7	2n		"	"	36853
2711.8	1		"	"	36865
2710.9	2		"	"	36877
2710.4	1		"	"	36884
2709.7	1		"	"	36893
2708.9	1		"	"	36904
2708.7	2		"	"	36907
2707.8	1		"	"	36919

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2707.1	1n		0.78	10.7	36929
2706.8	2		"	"	36933
2706.0	1		"	"	36944
2705.8	1		"	"	36947
2703.6	2		"	"	36977
2703.2	2		"	10.8	36982
2702.22	4		"	"	36995.8
2701.6	2		"	"	37004
2700.6	2		"	"	37018
2700.3	1		"	"	37022
2699.4	2b		"	"	37034
2698.6	1		0.77	"	37045
2698.1	2		"	"	37052
2697.80	4		"	"	37056.4
2696.0	1n		"	"	37081
2695.1	1n		"	"	37093
2694.7	2		"	"	37099
2694.6	2		"	"	37100
2694.2	1		"	"	37106
2692.7	1n		"	"	37126
2692.0	1n		"	"	37136
2691.2	2		"	"	37147
2689.2	1		"	"	37175
2688.4	2		"	"	37186
2687.7	1		"	"	37196
2687.2	2		"	"	37202
2686.6	1		"	"	37211
2685.5	1		"	"	37226
2685.3	1		"	"	37229
2684.6	1		"	"	37238
2683.8	2		"	"	37250
2683.4	2		"	"	37255
2681.7	1		"	"	37279
2680.8	1		"	"	37291
2679.78	4		"	"	37305.7
2679.2	1		"	10.9	37314
2678.1	2		"	"	37329
2676.5	1		"	"	37351
2676.1	2		"	"	37357
2675.4	1		"	"	37367
2674.9	1		"	"	37374
2674.3	1		"	"	37382
2673.2	1		"	"	37397
2672.9	1		"	"	37402
2671.7	1		"	"	37418
2670.6	2		"	"	37434
2669.5	2		"	"	37449
2668.2	1		"	"	37467
2667.9	1		"	"	37472
2666.7	2		"	"	37489
2666.2	2		"	"	37496
2665.9	1n		"	"	37500
2665.2	1		"	"	37510
2664.41	4		"	"	37520.9
2664.1	1		"	"	37525



TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2663·7	1		0·77	10·9	37531
2663·0	1		"	"	37541
2662·4	1		"	"	37549
2661·8	1n		"	"	37558
2660·8	1		"	"	37572
2659·9	1		"	"	37584
2659·4	1		"	"	37591
2658·10	4		"	"	37609·0
2658·0	1		"	"	37611
2657·5	1		"	"	37618
2656·7	1		"	"	37630
2656·2	1		"	"	37637
2655·7	1		"	"	37644
2654·7	1		0·76	11·0	37658
2654·5	1		"	"	37661
2653·7	2		"	"	37672
2652·1	2		"	"	37695
2651·5	1		"	"	37703
2651·1	1		"	"	37709
2650·4	1		"	"	37719
2650·0	1		"	"	37725
2649·8	1		"	"	37728
2647·81	4		"	"	37756·1
2646·9	1		"	"	37769
2646·2	1		"	"	37779
2645·7	1		"	"	37786
2644·7	1		"	"	37800
2644·1	1		"	"	37809
2643·3	2		"	"	37820
2643·1	2		"	"	37823
2641·1	1		"	"	37852
2639·6	1		"	"	37874
2639·2	1		"	"	37879
2638·7	1		"	"	37886
2638·3	1		"	"	37892
2637·2	1		"	"	37908
2636·7	1n		"	"	37915
2635·4	2		"	"	37934
2634·9	1		"	"	37941
2634·0	2		"	"	37954
2633·2	1		"	"	37966
2632·9	1		"	"	37970
2631·4	2		"	11·1	37992
2630·4	1		"	"	38006
2629·6	1n		"	"	38018
2629·1	2		"	"	38025
2628·3	1		"	"	38036
2628·1	1		"	"	38039
2627·8	1		"	"	38044
2626·9	1n		"	"	38057
2626·5	1		"	"	38062
2626·3	1		"	"	38065
2625·7	1n		"	"	38074
2625·2	1n		"	"	38081
2624·0	1		"	"	38099

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2622.9	1		0.76	11.1	38115
2622.3	2n		"	"	38123
2621.7	2		"	"	38132
2620.8	2		"	"	38145
2620.25	4		"	"	38153.2
2619.2	1		"	"	38169
2618.0	1		"	"	38186
2617.2	1		"	"	38198
2616.7	1		"	"	38205
2615.48	4		"	"	38222.8
2614.4	1n		"	"	38239
2613.8	2		"	"	38247
2613.1	1		"	"	38258
2612.8	2		"	"	38262
2611.9	2		"	"	38275
2611.4	1		"	"	38283
2610.7	1		"	"	38293
2610.3	1		"	"	38299
2609.2	1		0.75	11.2	38315
2608.4	1		"	"	38327
2607.1	2		"	"	38346
2606.5	2		"	"	38355
2606.4	1		"	"	38356
2605.9	1		"	"	38363
2605.5	1		"	"	38369
2604.5	1		"	"	38384
2604.2	1		"	"	38389
2603.6	1		"	"	38397
2603.07	4		"	"	38405.0
2602.58	4		"	"	38412.2
2602.1	1		"	"	38420
2601.5	2		"	"	38428
2601.2	1		"	"	38433
2600.9	1		"	"	38437
2599.7	2 Fe		"	"	38455
2598.9	2		"	"	38467
2598.5	2		"	"	38473
2597.9	2		"	"	38482
2596.9	1		"	"	38496
2596.2	1n		"	"	38507
2595.6	1		"	"	38516
2594.9	1		"	"	38526
2593.8	1		"	"	38542
2593.4	1		"	"	38548
2592.9	1		"	"	38556
2592.6	1		"	"	38560
2591.5	1		"	"	38577
2589.7	1		"	"	38604
2589.20	4		"	"	38610.8
2588.5	1		"	11.3	38621
2587.9	1		"	"	38630
2587.5	1		"	"	38636
2587.2	1		"	"	38641
2586.6	1		"	"	38650
2586.3	1		"	"	38654
1898.					

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2585.7	1		0.75	11.3	38663
2585.1	1				38672
2584.2	2		"	"	38686
2583.3	1		"	"	38699
2582.5	1		"	"	38711
2582.3	1		"	"	38714
2581.22	4		"	"	38730.1
2580.3	1		"	"	38744
2579.8	1		"	"	38752
2579.60	4		"	"	38754.4
2579.32	4		"	"	38758.6
2578.7	1		"	"	38768
2578.2	1		"	"	38776
2577.8	1		"	"	38782
2577.5	1		"	"	38786
2577.2	1		"	"	38791
2576.7	1		"	"	38798
2576.2	2		"	"	38806
2576.0	2		"	"	38809
2574.9	ln		"	"	38825
2574.1	ln		"	"	38838
2573.8	1		"	"	38842
2573.4	1		"	"	38848
2573.2	1		"	"	38851
2572.7	1		"	"	38859
2572.4	1		"	"	38863
2572.30	4		"	"	38864.4
2571.45	4		"	"	38877.3
2569.8	1		"	"	38903
2568.7	2		"	11.4	38919
2567.8	1		"	"	38933
2567.7	1		"	"	38934
2567.4	2		"	"	38939
2566.8	1		"	"	38948
2566.6	1		"	"	38951
2566.2	1		"	"	38957
2565.7	1		"	"	38965
*2564.4	ln		0.74	"	38984
2563.7	2		"	"	38995
2563.4	1		"	"	39000
2563.22	4		"	"	39002.0
2562.5	2		"	"	39013
2562.2	1		"	"	39018
2561.9	1		"	"	39023
2561.5	1		"	"	39029
2560.7	1		"	"	39041
2559.9	1		"	"	39053
2559.4	2		"	"	39061
2557.9	2		"	"	39084
2557.4	1		"	"	39091
2557.1	1		"	"	39096
2556.9	1		"	"	39099
2556.6	1		"	"	39103

\* Double.

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
2555.9	1		0.74	11.4	39114
2555.13	4		"	"	39125.5
2554.8	2		"	"	39131
2554.6	2		"	"	39134
2553.7	1		"	"	39148
2553.1	2		"	"	39157
2552.2	2		"	"	39171
2552.0	1		"	"	39174
2551.3	2		"	"	39185
2551.0	1		"	"	39189
2550.1	1		"	"	39203
2549.9	1		"	"	39206
2548.9	1		"	11.5	39222
2548.7	1		"	"	39224
2548.4	2		"	"	39228
2547.8	1		"	"	39238
2547.0	1		"	"	39250
2546.2	2		"	"	39262
2545.3	1		"	"	39276
2544.7	2		"	"	39285
2543.9	1		"	"	39298
2543.3	2		"	"	39307
2541.6	1n		"	"	39333
2541.4	1		"	"	39336
2540.9	2n		"	"	39344
2539.8	2		"	"	39361
2539.2	2		"	"	39370
2538.9	1		"	"	39375
2538.8	1		"	"	39377
2538.2	1		"	"	39386
2537.5	1		"	"	39397
2536.6	1		"	"	39411
2536.4	2		"	"	39414
2535.5	1		"	"	39428
2534.7	2		"	"	39440
2534.0	2		"	"	39451
2533.5	1		"	"	39459
2533.1	1		"	"	39465
2532.8	1		"	"	39470
2532.7	1		"	"	39472
2532.2	1		"	"	39479
2531.9	1		"	"	39484
2530.9	2		"	"	39500
2530.6	1		"	"	39504
2529.7	1		"	11.6	39518
2529.6	1		"	"	39520
2529.2	1		"	"	39526
2529.0	2		"	"	39529
2528.6	2		"	"	39536
2528.2	1		"	"	39542
2527.7	1		"	"	39550
2526.2	2		"	"	39573
2525.7	1		"	"	39581
2525.5	1		"	"	39584
2525.0	1		"	"	39592



TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark- Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2524·8	1		0·74	11·6	39595
2524·1	2		"	"	39606
2523·5	1		"	"	39615
2523·4	1		"	"	39617
2522·9	1		"	"	39625
2522·8	1		"	"	39626
2522·08	4		"	"	39637·2
2521·1	1		"	"	39653
2520·4	1		"	"	39664
2520·0	1		"	"	39671
2519·0	1		"	"	39686
2518·6	1		"	"	39693
2518·1	2		"	"	39700
2517·3	2		0·73	"	39713
2517·0	1		"	"	39718
2516·1	2		"	"	39732
2515·7	1		"	"	39738
2515·3	2		"	"	39745
2514·4	2		"	"	39759
2514·3	2		"	"	39761
2513·9	2		"	"	39767
2513·2	2		"	"	39778
2512·7	2		"	"	39786
2512·1	1		"	"	39795
2511·7	1		"	11·7	39802
2511·3	1		"	"	39808
2510·9	1		"	"	39814
2510·52	4		"	"	39820·7
2509·9	1		"	"	39830
2509·6	1		"	"	39835
2508·6	1		"	"	39851
2507·9	1 C?		"	"	39862
2507·1	1		"	"	39875
2506·8	1		"	"	39879
2506·0	2		"	"	39892
2505·5	1n		"	"	39900
2504·7	1n		"	"	39913
2503·6	1n		"	"	39930
2502·0	1		"	"	39956
2501·8	1		"	"	39959
2501·0	1		"	"	39972
2500·8	1		"	"	39975
2500·1	2		"	"	39986
2499·7	1		"	"	39993
2499·2	2		"	"	40001
2498·9	1		"	"	40006
2498·2	1n		"	"	40017
2497·5	2		"	"	40028
2496·6	2		"	"	40042
2495·5	1		"	"	40060
2495·3	1		"	"	40063
2494·9	1		"	"	40070
2494·1	1n		"	11·8	40083
2492·9	2		"	"	40102
2492·3	2		"	"	40112

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2491·7	1		0·73	11·8	40121
2490·6	2		"	"	40139
2490·2	1		"	"	40145
2489·9	1		"	"	40150
2489·35	4		"	"	40159·3
2488·92	4		"	"	40166·3
2488·2	2		"	"	40178
2487·5	1		"	"	40189
2487·3	1		"	"	40192
2486·3	1n		"	"	40208
2485·6	1n		"	"	40220
2484·7	1n		"	"	40234
2484·3	2		"	"	40241
2484·0	1		"	"	40246
2483·6	2 C		"	"	40252
2482·1	2		"	"	40276
2481·6	2		"	"	40285
2480·9	1		"	"	40296
2480·2	2		"	"	40307
2479·1	1		"	"	40325
2478·9	1		"	"	40328
2478·7	1		"	"	40332
2478·3	1		"	"	40338
2477·93	4		"	"	40344·5
2477·2	2		"	"	40356
2476·6	1n		"	11·9	40366
2475·7	1		"	"	40381
2475·6	2		"	"	40382
2474·3	1		"	"	40403
2474·2	1		"	"	40405
2473·9	1n		"	"	40410
2473·2	1		"	"	40421
2472·4	1		"	"	40435
2471·7	2		"	"	40446
2470·9	1		"	"	40459
2469·9	2		0·72	"	40475
2469·2	1		"	"	40487
2468·4	2		"	"	40500
2467·4	1		"	"	40516
2466·5	2		"	"	40531
2465·9	1		"	"	40541
2465·6	2		"	"	40546
2465·2	1		"	"	40553
2464·6	2		"	"	40563
2464·2	1		"	"	40569
2464·0	1		"	"	40572
2463·2	2		"	"	40586
2462·8	1		"	"	40592
2462·3	1		"	"	40600
2461·9	1		"	"	40607
2461·4	2		"	"	40615
2461·2	2		"	"	40619
2460·4	1n		"	"	40632
2459·8	1		"	12·0	40642
2459·6	1		"	"	40645

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2459.2	1		0.72	12.0	40652
2458.7	2		"	"	40660
2458.5	2		"	"	40663
2457.1	2		"	"	40686
2456.5	1		"	"	40696
2456.1	1		"	"	40703
2455.9	2		"	"	40706
2454.9	1		"	"	40723
2454.8	1		"	"	40725
2453.8	1		"	"	40741
2452.9	1		"	"	40756
2452.0	1		"	"	40771
2450.3	1		"	"	40799
2449.7	2		"	"	40809
2448.6	1		"	"	40828
2448.2	2		"	"	40834
2447.2	1		"	"	40851
2446.50	4		"	"	40862.7
2445.5	1		"	"	40879
2444.9	1		"	"	40889
2444.6	1		"	"	40894
2444.2	1		"	"	40901
2441.6	1		"	12.1	40945
2441.4	1		"	"	40948
2439.9	1		"	"	40973
2439.4	1		"	"	40982
2438.3	1		"	"	41000
2437.4	2		"	"	41015
2436.6	1		"	"	41029
2435.9	1		"	"	41041
2435.4	1		"	"	41049
2435.0	2		"	"	41056
2434.4	1		"	"	41066
2434.2	1		"	"	41069
2433.1	1		"	"	41088
2432.9	1		"	"	41091
2432.2	1		"	"	41103
2431.6	1		"	"	41113
2430.7	1		"	"	41128
2429.8	1n		"	"	41144
2428.7	1		"	"	41162
2428.3	1		"	"	41169
2427.8	1		"	12.2	41178
2427.5	2		"	"	41183
2426.6	1		"	"	41198
2425.9	1n		"	"	41210
2424.9	1		"	"	41227
2424.6	1		"	"	41232
2424.1	1		"	"	41240
2423.9	1		"	"	41244
2423.3	1		"	"	41254
2422.5	1		"	"	41268
2422.3	1		"	"	41271
2421.1	2		0.71	"	41292
2420.6	2		"	"	41300

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2420.0	ln		0.71	12.2	41310
2419.4	2		"	"	41321
2418.2	1		"	"	41341
2417.9	1		"	"	41346
2417.6	2		"	"	41351
2416.0	1		"	"	41379
2415.7	1		"	"	41384
2414.8	2		"	"	41399
2414.2	1		"	"	41410
2413.3	1		"	"	41425
2412.8	1		"	12.3	41434
2411.9	1		"	"	41449
2411.6	1		"	"	41454
2411.4	1		"	"	41458
2411.2	1		"	"	41460
2410.5	2		"	"	41473
2409.5	1		"	"	41490
2409.3	1		"	"	41494
2408.3	2		"	"	41511
2407.8	2		"	"	41520
2407.2	1		"	"	41530
2406.6	1		"	"	41540
2406.3	1		"	"	41546
2406.0	1		"	"	41551
2405.6	1		"	"	41558
2405.3	1		"	"	41563
2404.9	2		"	"	41570
2404.3	2		"	"	41580
2403.4	1		"	"	41596
2402.4	1		"	"	41614
2399.9	1		"	"	41656
2399.2	1 Fe		"	"	41669
2398.1	2		"	12.4	41688
2397.12	4		"	"	41704.3
2396.2	1		"	"	41721
2395.6	2		"	"	41731
2395.4	1		"	"	41735
2395.1	1		"	"	41740
2394.4	1		"	"	41752
2393.2	1		"	"	41773
2393.0	2		"	"	41777
2391.8	1		"	"	41798
2391.2	1		"	"	41808
2390.9	1		"	"	41813
2390.4	2		"	"	41822
2389.8	2		"	"	41833
2389.3	1		"	"	41841
2388.8	1		"	"	41850
2388.6	1		"	"	41854
2387.7	ln		"	"	41869
2386.5	1		"	"	41890
2386.2	1		"	"	41896
2385.5	1		"	"	41908
2385.3	2		"	"	41911
2383.5	1		"	"	41943



TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2382.7	1		0.71	12.5	41956
2382.4	1		"	"	41961
2382.0	1		"	"	41969
2381.8	1		"	"	41972
2381.4	1		"	"	41979
2381.2	1		"	"	41983
2380.9	1		"	"	41988
2380.4	1		"	"	41997
2380.3	1		"	"	41999
2379.7	1		"	"	42009
2378.2	1		"	"	42036
2377.1	1		"	"	42055
2375.9	1		"	"	42076
2374.5	2		"	"	42101
2373.7	1		0.70	"	42115
2373.4	1		"	"	42121
2372.7	2		"	"	42133
2371.9	1		"	"	42147
2371.1	1		"	"	42162
2370.1	2		"	"	42179
2369.0	1		"	"	42199
2368.4	2		"	12.6	42210
2367.8	1		"	"	42220
2367.2	1		"	"	42231
2366.7	1		"	"	42240
2365.9	1		"	"	42254
2365.5	1		"	"	42261
2364.4	2		"	"	42281
2364.1	1		"	"	42286
2363.5	1		"	"	42297
2362.2	2		"	"	42320
2361.7	1		"	"	42329
2361.3	1		"	"	42337
2359.4	1		"	"	42371
2358.9	2		"	"	42380
2358.1	1		"	"	42394
2357.4	1		"	"	42407
2356.9	1		"	"	42416
2353.7	1		"	12.7	42473
2353.5	1		"	"	42477
2351.6	1		"	"	42511
2351.3	1		"	"	42517
2350.4	1		"	"	42533
2349.9	1		"	"	42542
2349.4	2		"	"	42551
2348.2	2b		"	"	42573
2346.5	1		"	"	42604
2345.0	1		"	"	42631
2344.5	1		"	"	42640
2343.7	2		"	"	42655
2341.4	1		"	"	42696
2339.7	1		"	12.8	42728
2339.1	1		"	"	42738
2337.7	1		"	"	42764
2336.8	1		"	"	42781

TUNGSTEN (SPARK SPECTRUM)—*continued*.

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2336.0	1		0.70	12.8	42795
2335.2	1		"	"	42810
2334.7	1		"	"	42819
2333.9	2		"	"	42834
2333.2	1		"	"	42847
2332.2	1		"	"	42865
2331.6	1		"	"	42876
2330.6	1		"	"	42894
2329.5	1		"	"	42915
2328.4	1		"	"	42935
2327.6	ln		"	12.9	42950
2326.7	ln		"	"	42966
2326.0	2		"	"	42979
2324.7	1		0.69	"	43003
2324.0	1		"	"	43016
2323.1	2		"	"	43033
2321.0	1		"	"	43072
2319.0	1		"	"	43109
2318.0	1		"	"	43128
2314.7	1		"	"	43189
2314.2	1		"	13.0	43198
2313.0	1		"	"	43221
2310.7	1		"	"	43264
2309.9	1		"	"	43279
2307.1	1		"	"	43331
2305.8	1		"	"	43356
2302.7	1		"	"	43414
2301.9	1		"	"	43429
2300.5	1		"	13.1	43456
2299.4	ln		"	"	43477
2298.9	1		"	"	43486
2298.5	1		"	"	43494
2297.2	ln C?		"	"	43518
2295.7	1		"	"	43547
2294.3	1		"	"	43573
2293.2	1		"	"	43594
2291.6	ln		"	"	43625
2290.8	1		"	"	43640
2288.8	1		"	"	43678
2284.8	ln		"	13.2	43755
2284.1	ln		"	"	43768
2283.4	ln		"	"	43781
2282.1	1		"	"	43806
2281.4	1		"	"	43820
2281.1	1		"	"	43825
2280.7	1		"	"	43833
2278.3	1		"	"	43879
2277.9	1		0.68	"	43887
2275.3	1		"	13.3	43937
2272.7	ln		"	"	43988
2270.5	1		"	"	44030
2266.5	1		"	"	44108
2264.6	1		"	"	44145
2263.3	1		"	13.4	44170
2262.6	1		"	"	44184

TUNGSTEN (SPARK SPECTRUM)—*continued.*

Wave-length Spark Spectrum (Rowland)	Intensity and Character	Previous Measurements (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2260.3	1		0.68	13.4	44229
2259.4	1		"	"	44247
2258.4	1		"	"	44266
2257.4	1		"	"	44286
2256.7	1		"	"	44299
2255.2	1		"	"	44329
2251.6	1		"	"	44400
2250.9	1		"	13.5	44413
2250.2	1		"	"	44426
2249.5	1		"	"	44440
2248.7	1		"	"	44456
2245.9	1		"	"	44512
2245.3	1		"	"	44523
2243.8	1		"	"	44553
2243.0	ln		"	"	44569
2241.4	1		"	"	44601
2240.2	ln		"	"	44625
2237.1	1		"	13.6	44687
2235.6	1b		"	"	44717
2231.4	1		"	"	44801
2229.6	1		0.67	"	44837
2227.0	ln		"	"	44889
2226.1	ln		"	13.7	44908
2222.3	1		"	"	44984
2221.7	1		"	"	44997
2219.4	1		"	"	45043
2218.0	1		"	"	45072
2216.2	1		"	"	45108
2215.5	1		"	"	45123
2215.1	1		"	13.8	45131
2208.7	1		"	"	45262
2206.7	1		"	"	45303
2204.4	1		"	"	45350
2201.1	1		"	13.9	45418
2198.9	1		"	"	45463
2198.2	1		"	"	45478
2197.7	1		"	"	45488
2196.0	1		"	"	45523
2194.9	1		"	"	45546
2193.2	1		"	"	45581
2189.7	1		"	14.0	45654
2186.7	1		"	"	45717
2186.0	ln		"	"	45732
2182.2	1		"	"	45811
2166.2	1		0.66	14.2	46150
2163.7	1		"	"	46203
2161.2	ln		"	"	46257
2153.7	1		"	14.3	46418
2152.5	1		"	"	46444
2146.2	1		"	14.4	46580

## PLATINUM (SPARK AND ARC SPECTRA).

Kayser: 'Abhandl. kōngl. Akad. Wissensch. Berlin,' 1897.

Exner and Haschek: 'Sitz. kaiserl. Akad. Wissensch. Wien,' civ. (1895), cv. 1896, cvi. (1897).

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
	5861·074		2		1·60	4·6	17057·1
	5845·050		4	5845·1 Thalén	1·59	"	17103·9
	5840·354		5		"	"	17117·7
	5763·778		3		1·57	4·7	17345·0
	5762·877		3		"	"	17347·7
	5728·369		0		1·56	"	17452·3
	5700·672		0		1·55	4·8	17537·0
	5699·190		1		"	"	17541·6
	5684·908		2		"	"	17585·6
	5660·245		2		1·54	"	17662·3
	5626·077		4		1·53	"	17769·6
	5514·324		4		1·50	4·9	18129·7
	5478·722		6	5478·1 "	"	5·0	18247·4
	5475·996		6	5475·6 "	1·49	"	18256·5
	5469·714		2		"	"	18277·5
	5452·984		0		"	"	18333·6
	5391·010		4		1·47	5·1	18544·3
	5388·105		2	5389·6 "	"	"	18554·3
	5369·188		4	5367·6 "	"	"	18619·7
	5324·799		0		1·45	"	18774·9
	5319·540		0		"	"	18793·5
	5306·493		0		"	"	18839·8
	5301·182		6	5301·6 "	"	5·2	18858·5
	5295·918		0		"	"	18877·3
	5286·289		0n		1·44	"	18911·7
	5275·008		0n		"	"	18952·1
	5265·290		0		"	"	18987·1
	5260·982		3		"	"	19002·7
	5257·609		0n		"	"	19014·9
	5227·782		6	5226·2 "	1·43	"	19123·4
	5208·775		0		1·42	5·3	19200·4
	5194·050		1		"	"	19247·5
	5118·583		1		1·40	"	19531·4
	5095·950		0n		1·39	5·4	19618·0
	5059·658		5	5059·6 "	1·38	"	19758·8
	5050·006		1		"	"	19796·5
	5044·645		6		"	"	19817·6
	5044·194		4		"	"	19819·4
	5038·681		0		"	"	19841·1
	5037·859		0n		"	"	19844·3
	5033·686		4		"	"	19860·7
	5002·762		2		1·37	5·5	19983·5
	4998·123		2		"	"	20002·0
	4980·532		1		1·36	"	20072·7
	4879·700		4	4879·1 "	1·34	5·6	20487·5
	4862·577		0		1·33	"	20559·6
	4854·067		4		"	5·7	20595·6
	4831·371		0		1·32	"	20692·4
	4772·467		1		1·31	5·8	20947·7
	4746·046		1		1·30	"	21064·4
	4739·924		1		"	"	21091·6

NOTE.—In the arc spectrum the intensities are estimated on a scale from 0 to 10:0 denoting a very weak line.



PLATINUM (SPARK AND ARC SPECTRA)—*continued*.

Wave-length		Intensity and Character		Previous Observations (Angström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda}$	
	4737.722		2		1.30	5.8	21101.4
	4684.255		4		1.28	5.9	21342.2
	4658.105		5		"	"	21462.0
	4650.192		1		1.27	"	21498.6
4640.8 } 4640.5 }	4639.984	1	4		"	"	21545.9
	4580.828		2		1.25	6.0	21824.1
	4580.685		2		"	"	21824.8
4577.0	4577.584	1n	4		"	"	21839.6
4560.2	4560.209	1	4		"	6.1	21922.7
4558.9		1			"	"	21929
4554.8	*4554.759	1	4		"	"	21949.0
4554.3		2			"	"	21951
4552.62	*4552.586	4	5n	4551.9 Thalén	"	"	21959.4
	4552.116		2		"	"	21961.7
4548.0	4548.056	1	3n		"	"	21981.3
4546.3		1			"	"	21990
4523.2	4523.192	1	5n		1.24	"	22102.2
4521.2	4521.099	1	5n	4521 Huggins	"	"	22112.4
4514.3		1			"	"	22146
4511.3	4511.417	1	5n		"	"	22159.9
4510.9		1			"	"	22162
4505.0		1			1.23	"	22191
4498.93	*4498.926	4	6	4498.3 Thalén	"	"	22221.4
4495.0		1			"	6.2	22241
4493.4	4493.350	1	3		"	"	22249.0
4492.7		1			"	"	22252
4484.8	4484.882	1	5n		"	"	22290.9
4482.2		1			"	"	22304
4481.9	4481.808	1	3		"	"	22306.2
4473.7	4473.633	1	3n		"	"	22347.0
4471.8		1			"	"	22356
4458.9		1			1.22	"	22421
4457.2		1			"	"	22429
4453.3		1n			"	"	22449
4448.8		1			"	"	22472
4445.7	*4445.710	1	4		"	"	22487.4
4442.73	*4442.730	4	6	4442.1 "	"	"	22502.5
4437.5	4437.470	1	4n		"	"	22529.2
	4414.420		2		1.21	6.3	22646.7
4411.5	4411.580	1n	3		"	"	22661.3
4410.9		1			"	"	22665
4409.0		1n			"	"	22675
4392.0	*4391.999	2	4	4389.5 "	1.20	"	22762.4
4372.0		1			"	"	22866
4364.5	4364.624	1	4		"	6.4	22905.1
4358.5	4358.522	1n	2n		"	"	22937.2
4351.3		2n			1.19	"	22944
4347.0		1			"	"	22998
	4343.852		0		"	"	23014.7
4341.9		1			"	"	23025
4334.8	4334.827	1n	2		"	"	23062.6
4327.2	*4327.243	4	4	4327.0 "	"	"	23103.0

\* Rowland 4554.828, 4552.594, 4498.930, 4445.713, 4442.723, 4391.996, 4327.320.

PLATINUM (SPARK AND ARC SPECTRA)—*continued*.

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
4309.3		1n			1.18	6.4	23199
4291.2	4291.070	1	2	(Rowland)	"	6.5	23298.5
4288.6	4288.215	1	4	4288.217 R.	"	"	23313.2
	4281.905		1		"	"	23347.6
4275.2		1			1.17	"	23384
4274.2	4274.042	1	2		"	"	23390.6
4271.2		1n			"	"	23406
4269.7	4269.411	1n	2		"	"	23415.9
4263.8	4263.664	1n	2		"	"	23447.5
4260.1		1			"	"	23467
	4251.277		1		"	6.6	23515.7
4247.8	4247.838	1n	1		"	"	23534.8
4226.85 Ca		4			1.16	"	23661.7
4223.8		1			"	"	23669
4222.7		1			"	"	23675
4221.2		1			"	"	23683
4214.2		1			"	"	23723
4213.3		1			"	"	23728
4211.5		1			"	"	23738
4205.8		2n			1.15	"	23770
4202.2		1			"	"	23790
4201.5	4201.374		2		"	"	23795.2
4194.5		1			"	6.7	23834
4192.55	4192.577	4	4	.589 "	"	"	23845.0
4185.7		2n			"	"	23884
4170.5		1			"	"	23971
4167.5		1			1.14	"	23988
4166.5		1			"	"	23994
4164.72	4164.709	4	4	.722 "	"	"	24004.6
4163.5		2n			"	"	24012
4159.0		1			"	"	24037
4148.5		1			"	6.8	24098
4134.3		1			"	"	24181
4133.7		2n			"	"	24185
4132.5		1			"	"	24192
4129.7		1			1.13	"	24208
4118.86	4118.854	6	5	.838 "	"	"	24271.8
4092.5	4092.426	1	3	.421 "	1.12	6.9	24428.5
4090.5		1			"	"	24440
4087.7		1			"	"	24457
	4081.631		1	.627 "	"	"	24493.1
4078.1		1			"	"	24514
4072.2		2			"	"	24550
4066.5	4066.087	1	2	.094 "	"	"	24586.8
4063.0		1			"	"	24605
4061.9		1			"	"	24612
4060.7		1n			"	"	24619
4055.0	4054.928	1	2	.925 "	1.11	"	24654.4
4051.2		1			"	7.0	24677
4050.2		1			"	"	24683
4046.55		4			"	"	24705.4
4034.3		1			"	"	24780
4024.0		1			"	"	24844
4021.4		1			"	"	24860
4014.3		1			1.10	"	24904

PLATINUM (SPARK AND ARC SPECTRA)—*continued*.

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
4007.5		1			1.10	7.0	24946
4002.7	4002.649	1	2		"	7.1	24976.3
3996.7	3996.720	1	3	.722 R.	"	"	25013.4
	3980.746		1		"	"	25113.8
3979.0		ln			"	"	25125
3976.5	3976.460	1	1		"	"	25140.9
3975.8		1			1.09	"	25145
3972.0		1			"	"	25169
3971.3		1			"	"	25174
3970.1		2			"	"	25181
3969.3		1			"	"	25186
3968.5 Ca		6			"	"	25191
3966.48	3966.507	6	3	.504 "	"	"	25204.0
3961.7		1			"	"	25235
3958.0		1			"	"	25258
3953.1	3953.780	ln	1		"	7.2	25285.0
3950.6		ln			"	"	25305
3948.4	3948.550	1	4	.539 "	"	"	25318.6
3931.0		1			1.08	"	25432
3930.5		1			"	"	25435
3927.1		1			"	"	25457
3926.6		1			"	"	25460
3925.50	3925.483	4	4	.486 "	"	"	25467.4
3923.12	3923.105	8	5	.106 "	"	"	25482.8
3911.1	3911.045	1	3	.050 "	"	"	25561.4
3910.6		1			"	"	25564
3908.5		1			"	7.3	25578
	3906.433		2		"	"	25591.5
3904.4	3904.534		3		"	"	25604.0
	3903.864		2		"	"	25608.4
3902.3		1			"	"	25619
3900.90	3900.873	4	4	.874 "	"	"	25628.0
3898.92	3898.880	4	4	.886 "	"	"	25641.1
3895.5		1			1.07	"	25663
3894.9		1			"	"	25667
3892.0		ln			"	"	25688
3890.5		ln			"	"	25696
3889.2		ln			"	"	25705
3887.5		1			"	"	25716
3885.3		ln			"	"	25731
3884.3		ln			"	"	25737
3883.3		ln			"	"	25744
3881.1		ln			"	"	25759
3875.83		4			"	"	25793.6
3873.7		ln			"	"	25808
3868.60		4			"	"	25842
3863.3		1			"	"	25877
3856.5		1			1.06	"	25923
3854.8		ln			"	"	25934
3852.7		1			"	"	25948
3847.6		ln			"	"	25983
3845.3		1			"	"	25998
3843.8		1			"	"	26009
3838.3		2			"	"	26046
3837.8		ln			"	"	26049

PLATINUM (SPARK AND ARC SPECTRA)—*continued.*

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
3835.2	3818.827	ln	5	.827 R.	1.06	7.3	26067
3833.1		1			"	"	26081
3829.5		1			"	"	26106
3827.2		1			"	"	26121
3818.82		6			"	"	26178.7
3815.3		2			1.05	7.4	26203
3808.4					"	"	26250
3807.2					"	"	26259
3805.6		1			"	"	26270
3803.3		ln			"	"	26286
3802.6		1			"	"	26290
3801.3					"	"	26299
3798.2		1			"	"	26321
3791.8		ln			"	"	26365
3789.8		1			"	"	26379
3788.8		1			"	"	26386
3785.3		ln			"	"	26411
3776.7		ln			1.04	"	26471
3775.0		ln			"	"	26483
3771.3		ln			"	7.5	26509
3770.3		ln			"	"	26516
3768.7	3706.685		3	.667 "	"	"	26527
3767.5		2			"	"	26535
3766.7					"	"	26541
3764.1		2			"	"	26559
3761.4		ln			"	"	26578
3754.8		1			"	"	26625
3750.0					"	"	26659
3749.0		1			"	"	26666
3747.4		1			"	"	26678
3746.2		1			"	"	26686
3743.8		1			"	"	26703
3740.6		1			"	"	26726
3739.4		1			"	"	26735
3735.9		1			1.03	"	26760
3732.2		1			"	"	26786
3731.6		1			"	"	26791
3728.9		1			"	"	26810
3728.3		1			"	7.6	26814
3727.7		2n			"	"	26819
3725.6		1			"	"	26834
3722.9	3700.070	2	4	.059 "	"	"	26853
3722.6		1			"	"	26855
3716.8		ln			"	"	26897
3712.0		ln			"	"	26932
3706.8		2			"	"	26970.6
3705.3		1			"	"	26981
3700.4		1			"	"	27016
3700.3		1			"	"	27018.9
3699.2		1			"	"	27025
3695.0		1			1.02	"	27056
3690.6		1			"	"	27088
3687.7		8		.554 "	"	"	27110.5
3683.2		1		.123 "	"	7.7	27142.8
3682.5		1			"	"	27148



PLATINUM (SPARK AND ARC SPECTRA)—*continued*.

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuum
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda}$	
3681·3	3681·227	1	0	·229 R.	1·02	7·7	27157·1
3680·8		1			"	"	27160
3680·2		1			"	"	27165
3676·1		1			"	"	27196
3675·2	3675·107	2	1		"	"	27202·4
3674·3	3674·207	6	4	·191 "	"	"	27209·0
3672·2	3672·165	6	4	·142 "	"	"	27224·2
3668·6	3668·564	1	1		"	"	27251·0
3666·5		1			"	"	27266
3664·5		1			"	"	27281
3663·5	3663·239	1	4	·242 "	"	"	27290·5
3662·0		1			"	"	27300
3659·6	3659·571	1	2	·564 "	"	"	27317·9
3658·3		1			"	"	27327
3654·9		1			1·01	"	27353
3654·2	3654·132	1	1		"	"	27358·6
3653·5		1			"	"	27363
3652·5	3652·411	1	1		"	"	27371·5
3651·8		1			"	"	27376
3643·3	3643·331	6n	6	·313 "	"	"	27439·7
3639·0	3638·956	6	6	·944 "	"	7·8	27472·6
3637·3		2			"	"	27485
3636·7		1			"	"	27490
3636·5		1			"	"	27491
3629·0	3629·025	6	3	·017 "	"	"	27547·8
3628·3	3628·275	8	5	·272 "	"	"	27553·5
3627·8		1			"	"	27557
3625·4		1			"	"	27575
3622·7		1n			"	"	27596
3621·8	3621·839	1	2	·812 "	"	"	27602·5
3617·3		1			1·00	"	27637
3615·4	3615·443	1	0		"	"	27651·4
3611·0	3611·057	2	2	·060 "	"	"	27684·9
3608·0		1			"	"	27708
3606·8		1			"	"	27718
3605·4		1n			"	"	27728
3602·9		1			"	"	27748
3602·4		1n			"	"	27751
3594·4		1n			"	7·9	27813
3589·2		1			"	"	27853
3587·7		1			"	"	27865
3587·1		1			"	"	27870
3585·8		1			"	"	27880
3585·4		1			"	"	27883
3583·2		1			"	"	27900
3578·8		1			"	"	27934
3578·0		1			0·99	"	27941
3577·6		1			"	"	27944
3574·2		1			"	"	27970
3573·5		1			"	"	27976
3572·3		1			"	"	27985
3571·4		1			"	"	27992
3568·5		1			"	"	28015
3565·4		1n			"	"	28039
3559·9		1n			"	"	28083

PLATINUM (SPARK AND ARC SPECTRA)—*continued*.

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
3559·1		1			0·99	7·9	28089
3558·7		1			"	"	28092
3557·3		1			"	"	28103
3555·0		1			"	"	28122
3553·2		2			"	"	28136
3551·6		2			"	8·0	28148
3550·3		1n			"	"	28159
3548·9		1			"	"	28170
3548·8		1			"	"	28171
3548·5		2			"	"	28173
3545·0		1			"	"	28201
3543·6		1			"	"	28212
3540·8		1			"	"	28234
3536·1		2			0·98	"	28272
3534·3		1n			"	"	28286
3531·8		1			"	"	28306
3528·7	3528·700	1	2	*691 R.	"	"	28331·0
3526·9		1			"	"	28346
3526·3		1n			"	"	28350
3523·7		1n			"	"	28371
3522·6		1			"	"	28380
3519·7		1			"	"	28404
3518·6		1			"	"	28412
3514·9	3514·869	1	4	·887 "	"	"	28442·6
3513·7		2			"	"	28452
3505·9	3505·848	1	1	·835 "	"	8·1	28515·7
3503·6		1			"	"	28534
3502·6		1			"	"	28542
3498·3	3498·321	1	1	·308 "	0·97	"	28577·0
3498·0		1			"	"	28580
3492·0		1n			"	"	28629
3491·1	3491·155	1n	1	·141 "	"	"	28635·7
3490·2		2			"	"	28644
	3488·877		1		"	"	28654·4
3487·8		1			"	"	28663
3485·3	3485·430	6	6	·411 "	"	"	28682·8
3483·5	3483·588	4	5	·561 "	"	"	28697·9
3482·4		1			"	"	28707
3480·6		2			"	"	28723
3476·9		2			"	"	28753
3474·9		1			"	"	28770
	3472·080		0		"	"	28793·1
3471·4		1n			"	"	28799
3464·1	3464·097	1	2	·080 "	"	8·2	28859·3
3460·9		1n			"	"	28886
3459·7		1			"	"	28896
3455·9		1			0·96	"	28928
3454·2	3454·290	1	3	·285 "	"	"	28941·3
3453·9		2			"	"	28945
3449·0		1			"	"	28986
3448·5	3448·523	1	1n		"	"	28989·7
3447·9		2			"	"	28995
3441·5		1			"	"	29049
3434·9		4			"	"	29105
3431·9	3432·000	2	2	·032 "	"	"	29129·3
1898.							II

## PLATINUM (SPARK AND ARC SPECTRA) —continued.

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda}$	
	3431.495		0		0.96	8.3	29133.5
3428.0	3428.079	4	4	·110 R.	"	"	29162.5
3426.9	3426.887	2	2	·880 "	"	"	29172.7
3425.7					"	"	29183
3424.8					"	"	29191
3422.1					"	"	29214
3421.2	3420.493	1	0		"	"	29227.3
	3418.311		0		"	"	29245.9
3417.1	3417.227	1	2		0.95	"	29255.2
3414.4	3414.610	1	2		"	"	29277.6
3409.3		1			"	"	29323
3408.6	3408.286	6	7	·277 "	"	"	29331.9
3407.7		1			"	"	29337
3406.7	3406.733	1	2		"	"	29345.4
3405.9		1			"	"	29353
3404.7		2			"	"	29363
3385.0		1			"	8.4	29534
3384.0		2			"	"	29542
3374.2		1n			0.94	"	29628
3373.2	3372.960	1	0		"	"	29639.2
3368.7	3368.626	1	2		"	"	29677.3
3367.2	3367.139	1n	4	·135 "	"	"	29690.4
3357.2		1			"	8.5	29778
3344.1	3344.031	2	4	·037 "	"	"	29895.5
3343.7		1			"	"	29899
3343.2		1			"	"	29903
3342.1	3342.429	1	1		"	"	29909.9
3341.3		1			"	"	29920
3340.4		1n			"	"	29928
3339.8		1			"	"	29933
3338.4		1n			0.93	"	29946
3338.1	3338.214	1	2		"	"	29947.7
3336.3		1n			"	"	29965
3334.1		1n			"	"	29985
3333.5		1			"	"	29990
3327.4	3327.234	1	0		"	"	30046.5
3326.1		1			"	"	30057
3325.9	3325.861	1	2		"	"	30058.9
3324.2		1			"	8.6	30074
3323.9	3323.914	2	6	·921 "	"	"	30076.5
3323.2		1			"	"	30083
3322.8		1			"	"	30087
3321.6		1			"	"	30097
3319.8		1			"	"	30114
3318.6		1			"	"	30125
3317.3		1n			"	"	30136
3315.6		1			"	"	30152
3315.2	3315.186	4	4	·182 "	"	"	30155.6
	3313.186		1		"	"	30173.8
3312.6	3312.614	2	3		"	"	30179.1
3312.1	3311.959	1	2		"	"	30185.0
3311.5	3311.504	1	1		"	"	30189.2
3310.2		1			"	"	30201
3308.0		1			"	"	30221
3307.8		1			"	"	30223

PLATINUM (SPARK AND ARC SPECTRA)—*continued*.

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
3305·9		1			0·93	8·6	30240
3304·3		1			"	"	30255
3303·0		1			"	"	30267
3301·9	3302·015	8	8n	·996 R.	"	"	30275·9
	3300·070		1n		"	"	30293·8
	3298·688		0n		0·92	"	30306·5
3297·0		1			"	"	30322
3293·8	3293·820		0		"	"	30351·3
	3293·615		0		"	"	30353·1
3292·6		1			"	"	30363
3291·5		1			"	"	30373
3290·4	3290·363	4	6	·370 "	"	"	30383·2
3288·6		2n			"	8·7	30399
3287·8		1n			"	"	30407
3286·8	3287·245	1	0		"	"	30411·9
3285·6	3285·367	2	0		"	"	30429·3
3284·9		1			"	"	30434
3284·6		1			"	"	30436
3283·4	3283·443	2	2	·436 "	"	"	30447·2
	3283·336		2	·332 "	"	"	30448·1
3282·6		1			"	"	30455
3282·0	3282·104	2	5	·097 "	"	"	30459·6
3279·9		1			"	"	30480
3278·6		1			"	"	30492
3277·5		1			"	"	30502
3274·0		6			"	"	30535
3273·1		1			"	"	30543
3272·1		1			"	"	30553
3270·8		1			"	"	30565
3269·3		1			"	"	30579
3268·5	3268·557	2	4	·570 "	"	"	30585·8
3267·1		1			"	"	30600
3266·5		1			"	"	30605
3266·2		1			"	"	30608
3265·5		1			"	"	30615
3264·2		1			"	"	30627
3263·9	3263·737	1	1		"	"	30631·0
3262·1		1			"	"	30646
3261·8	3261·818	2	4	·819 "	"	"	30649·0
3261·3	3261·202	1	2		"	"	30654·9
3259·8	3259·866	2	4	·859 "	0·91	"	30667·4
3258·7	3259·282	1	1		"	"	30672·9
3258·3	3258·551	1	0		"	"	30679·8
3256·6	3256·634	1	1		"	"	30697·9
3256·0	3256·048	4	6	·038 "	"	"	30703·4
3255·3	3255·356	1	0		"	"	30709·9
3255·0		1			"	"	30713
3254·5		1			"	"	30718
	3253·319		0		"	"	30729·1
	3252·785		1		"	8·8	30734·0
3252·0	3252·117	2	5	·103 "	"	"	30740·4
3250·4	3250·481	2	4	·475 "	"	"	30755·9
3249·1	3248·843	1	0		"	"	30771·4
	3248·623		2		"	"	30773·5
3247·6	3247·388	6	2		"	"	30785·2



PLATINUM (SPARK AND ARC SPECTRA)—*continued*.

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
3246.0		1			0.91	8.8	30798
3243.8	3243.533	2	2		"	"	30821.8
3242.9	3243.224	1	0		"	"	30824.8
3241.6	3241.652	1	1		"	"	20839.7
3240.9		1			"	"	30847
3240.3	3240.324	2	5	.323 R.	"	"	30852.4
3239.4		2			"	"	30861
3236.8		1			"	"	30886
3235.8		ln			"	"	30896
3233.58	3233.550	4	5	.541 "	"	"	30917.0
3230.42	3230.401	4	5	.406 "	"	"	30947.1
3229.4		1			"	"	30957
3227.3	3227.305	1	2	.290 "	"	"	30976.8
3225.5		1			"	"	30994
3224.1		1			"	"	31008
3223.7	3223.928	1	0		"	"	31009.2
	3222.930		0		"	"	31018.9
3222.6	3222.680	1	0		"	"	31021.3
	3221.416		0		"	"	31033.4
3220.9	3220.904	2	3		0.90	"	31038.4
3219.7		1			"	"	31050
3218.9	3218.972	ln	0		"	"	31057.0
	3218.603		1		"	"	31060.6
3216.5		ln			"	"	31081
3213.5		ln			"	8.9	31110
3212.4	3212.502	1	2	.493 "	"	"	31119.5
	3208.968		0		"	"	31153.8
	3207.347		0		"	"	31169.5
3204.27	3204.165	6	6	.161 "	"	"	31200.4
3203.1		1			"	"	31211
3202.6		1			"	"	31216
3201.9		1			"	"	31223
3201.0		4			"	"	31231
3200.79	3200.848	4	4	.830 "	"	"	31232.8
3199.1	3199.215	ln	0		"	"	31248.7
	3199.076		0		"	"	31250.1
3198.0		2			"	"	31261
3196.5		1			"	"	31275
3194.4		1			"	"	31296
3194.2		1			"	"	31298
3192.6	3192.635	1	3		"	"	31313.1
3191.3	3191.604	2	0		"	"	31323.3
3189.2		1			"	"	31347
3188.3		2			"	"	31356
3185.7		1			"	"	31381
3184.7		1			"	"	31391
3183.6		ln			"	"	31402
3181.5		ln			0.89	"	31423
3179.1	3179.650	2	1		"	9.0	31441.0
3177.8	3177.707	1	1		"	"	31460.2
3176.3	3176.081	1b	1n		"	"	31476.4
3175.0	3174.959	1	2		"	"	31487.5
3174.7		1			"	"	31490
3173.5		1			"	"	31502
3170.3		1b			"	"	31534

PLATINUM (SPARK AND ARC SPECTRA)—*continued.*

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
3169.1	3169.006	1	1		0.89	9.0	31546.6
3168.4		1			"	"	31553
3167.5		1n			"	"	31562
3164.6		1n			"	"	31591
3160.1	3160.314	1b	1		"	"	31633.5
3159.26	3159.841	4	0		"	"	31638.2
3156.70	3156.686	4	5	683 R.	"	"	31669.8
3155.8		1			"	"	31679
	3154.858		1		"	"	31688.1
3149.5		1			"	"	31742
3148.6		1			"	"	31751
3146.3		1n			"	9.1	31774
3145.2		2			"	"	31785
3144.3		2			"	"	31795
3142.0	3141.767	2	4		"	"	31820.1
3139.51	3139.503	4	7	505 "	0.88	"	31843.1
3137.8		1			"	"	31860
3137.3		1			"	"	31865
	3136.381		0		"	"	31874.8
3135.1		1			"	"	31888
	3134.413		1		"	"	31894.8
	3133.785		1		"	"	31901.1
3133.5	3133.443	2	4		"	"	31904.7
	3132.187		0		"	"	31917.4
3127.1		2			"	"	31969
3126.3		1n			"	"	31978
3124.1		1n			"	"	32000
3122.8	3123.065	1n	0		"	"	32010.7
3122.1	3122.192	1n	0		"	"	32019.7
3121.3		1			"	"	32029
3121.0		1			"	"	32032
3119.9	3119.911	2	4		"	"	32043.1
3119.0		1			"	"	32053
	3118.547		0		"	"	32057.1
3118.1		1n			"	"	32062
3117.4		1n			"	"	32069
3117.0		2			"	"	32073
3115.6		1b			"	"	32088
3114.5		1b			"	9.2	32099
3113.0	3112.718	1b	0		"	"	32117.1
3111.8		1b			"	"	32127
3109.5		1			"	"	32150
3108.7		1			"	"	32159
3108.2		1			"	"	32164
3104.8	3104.170	1	0		"	"	32205.5
3104.0	3103.704	2	2		"	"	32210.4
	3103.231		1		"	"	32215.3
3102.4	3102.710	1	0		"	"	32220.7
3101.1	3101.077	2	4	070 "	0.87	"	32237.6
3100.1	3100.146	4	4	136 "	"	"	32247.3
3098.0	3098.887	1	0n		"	"	32260.4
3097.1		1			"	"	32279
3089.3	3089.780	1	0		"	"	32355.6
3088.1	3088.677	1	0		"	"	32367.1

PLATINUM (SPARK AND ARC SPECTRA)—*continued*.

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
	3087·319		0		0·87	9·2	32381·4
3084·9	3084·978	1	2		"	"	32405·9
3084·1	3084·217	2	3		"	"	32413·9
3082·5	3082·779	1	0		"	9·3	32429·0
3081·1	3081·172	1	0		"	"	32445·9
3079·8	3079·674	1n	4		"	"	32461·7
	3078·948		0		"	"	32469·3
3076·8		2			"	"	32492
3076·1		1			"	"	32499
	3075·122		0		"	"	32509·8
3074·3	3074·938	1	1		"	"	32511·7
3072·1	3072·042	2	5	·042 R.	"	"	32542·3
3070·3	3070·369	1	2		"	"	32560·1
3069·8	3069·207	1	2		"	"	32572·4
3067·9		1			"	"	32586
3064·6	3064·825	8	6r	·824 "	"	"	32618·9
3063·6		1			"	"	32632
	3062·845		0		0·86	"	32640·0
	3062·3		0n		"	"	32645·9
	3061·905		1		"	"	32650·1
3059·8	3059·748	2	4	·749 "	"	"	32673·1
3059·2		1n			"	"	32679
3058·5		1n			"	"	32687
3057·5		1n			"	"	32697
3056·1	3056·719	2	0		"	"	32705·5
3055·5	3055·402	2	4		"	"	32719·6
3054·9	3054·8	1	2n		"	"	32726·1
	3054·4		2n		"	"	32730·4
3049·6		1			"	9·4	32782
3049·2		1			"	"	32786
3048·1	3048·6	1	2n		"	"	32792·5
3047·3		2			"	"	32807
3045·8		1			"	"	32823
3044·9		1			"	"	32832
3042·8	3042·752	4 Ir?	4r	·745 "	"	"	32855·6
3041·3	3041·323	2	2		"	"	32871·1
3040·8		1			"	"	32877
	3039·612		0		"	"	32889·6
3036·6	3036·554	4	6	·563 "	"	"	32922·7
3034·5		1			"	"	32945
3033·6		1			"	"	32955
3031·20		4			"	"	32980·8
3029·6		1			"	"	32998
3028·2		1			"	"	33014
3026·5	3026·446	1	2		"	"	33032·6
3025·3	3025·671	2	2		"	"	33041·1
	3025·179		2		"	9·5	33046·4
3024·5	3024·410	1	2		"	"	33054·8
3022·9	3022·957	1	3		0·85	"	33070·7
3021·1		1			"	"	33091
3020·7		1			"	"	33095
	3019·961		0		"	"	33103·5
3019·0		2			"	"	33114
3017·95	3018·003	4	4	·983 "	"	"	33125·0
3017·35	3017·450	4	2		"	"	33131·1

## PLATINUM (SPARK AND ARC SPECTRA) —continued.

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda}$	
	3015·510		2		0·85	9·5	33152·4
3015·2	3015·013	2n	0		"	"	33157·9
	3014·636		0		"	"	33162·0
3012·6	3012·498	2	2		"	"	33185·5
*3011·6		1n			"	"	33195
3010·9		1			"	"	33203
	3010·051		0		"	"	33212·5
3008·1		1n			"	"	33234
3007·7		1			"	"	33239
3006·0	3005·911	1n	2		"	"	33258·3
3004·4	3004·269	1n	2		"	"	33276·5
3003·6	3003·400	1	2		"	"	33286·1
3003·3		1			"	"	33287
3002·28	3002·385	4	4	·388 R.	"	"	33297·3
3001·23	3001·304	6	2		"	"	33309·4
3000·2		1			"	"	33322
2999·2		2			"	"	33333
2998·07	2998·087	2	7r	·079 "	"	"	33345·1
2996·0		1			"	9·6	33368
	2994·916		2		"	"	33380·3
2993·3		1			"	"	33398
2991·8		1			"	"	33415
2990·0	2989·915	1	4		"	"	33436·1
	2988·913		0		"	"	33447·4
	2988·177		0		"	"	33455·6
2987·1		1			"	"	33468
2985·6		1			"	"	33485
2985·1		1			"	"	33490
	2984·565		0		"	"	33496·1
2984·0	2983·882	1	2		"	"	33503·8
2983·1		1			"	"	33513
	2982·414		0		0·84	"	33520·3
2980·1		2			"	"	33546
2979·4		2			"	"	33554
2978·3	2978·179	1	2		"	"	33568·0
2975·9		1n			"	"	33594
2975·1		1			"	"	33603
2973·9	2974·252	2	0		"	"	33612·3
2973·4		1n			"	"	33622
2971·8		1n			"	"	33640
	2969·965		0		"	9·7	33660·7
2968·9		1			"	"	33673
2967·1	2967·596	1	0		"	"	33687·6
2964·8		1			"	"	33719
2964·6		1			"	"	33722
2962·9		1			"	"	33741
2962·3		1			"	"	33748
2961·3		1			"	"	33759
2960·8	2960·864		5n		"	"	33764·3
	2959·825		1		"	"	33776·0
2959·2	2959·219	2	4		"	"	33783·0
2958·6	2958·650	2	0		"	"	33789·5
2957·6		1n			"	"	33802
2955·9		2			"	"	33821
2955·0		1n			"	"	33831

\* Double.



PLATINUM (SPARK AND ARC SPECTRA)—*continued*.

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda}$	
2954.6		1n			0.84	9.7	33836
2954.1		1n			"	"	33842
2951.3	2951.341	1	2		"	"	33873.2
2950.3	2950.929	1	0		"	"	33877.9
2949.3	2949.900	1	2		"	"	33889.8
	2948.844		0		"	"	33901.9
2947.6		1n			"	"	33916
2947.0		1n			"	"	33923
2946.3		1			"	"	33931
2944.8	2944.879	2	3		"	9.8	33947.4
2943.2		1			"	"	33967
2942.8	2942.880		4		0.83	"	33970.5
	2941.908		0		"	"	33981.7
	2941.219		2		"	"	33989.7
2939.4		1			"	"	34011
2938.9	2938.935	2	4		"	"	34016.1
2938.2		1n			"	"	34025
2937.3		1			"	"	34035
2936.7		1			"	"	34042
2934.7		1			"	"	34065
2933.3	2933.837	1	0		"	"	34075.2
2931.7		2			"	"	34100
2930.9	2930.904	2	4		"	"	34109.4
2929.89	2929.903	6	8r		"	"	34121.1
2928.7		1			"	"	34135
2928.3	2928.226	1	4		"	"	34140.5
	2927.040		1		"	"	34154.4
2925.2		1			"	"	34176
2924.9		2			"	"	34179
	2922.381		0		"	"	34208.9
2921.5	2921.498		3		"	"	34219.2
	2921.336		1		"	9.9	34221.0
2919.43	2919.451		4		"	"	34243.1
2918.2		1			"	"	34258
2917.7		1			"	"	34264
	2916.505		2		"	"	34277.7
	2915.278		0		"	"	34292.1
2914.2	2914.443	2	0		"	"	34302.0
2913.65	2913.655	4	4		"	"	34311.2
	2913.361		2		"	"	34314.7
2912.35	2912.884	4	0		"	"	34320.4
	2911.888		0		"	"	34332.1
2910.6	2910.569	1	3		"	"	34347.6
2910.2		1			"	"	34352
	2908.928		0		"	"	34367.0
2908.1	2908.008	1	4		"	"	34377.9
2905.9	2906.001	2	4		"	"	34401.7
	2904.258		0		"	"	34422.3
	2903.129		0		0.82	"	34435.7
	2901.798		0		"	"	34451.5
	2901.282		2		"	"	34457.6
	2900.903		0		"	"	34462.2
2899.80	2899.764	4	1		"	"	34475.7
2898.03	2897.988	4	5		"	"	34496.8
2897.2		1			"	"	34506

PLATINUM (SPARK AND ARC SPECTRA)—*continued*.

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
	2896.245		1		0.82	10.0	34517.4
2895.7		1			"	"	34524
2894.02	2893.984	4	6		"	"	34544.5
2893.4	2893.335	2	4		"	"	34552.1
	2891.873		0		"	"	34569.7
	2891.170		0		"	"	34578.1
	2891.030		2		"	"	34579.8
2890.54	2890.495	4	2		"	"	34586.1
2889.8		1			"	"	34595
2888.2	2888.307	2	4		"	"	34612.3
2885.5	2885.447	2	0		"	"	34646.6
	2884.583		1		"	"	34657.1
2883.0		1			"	"	34676
2882.7		1			"	"	34680
2880.9		1			"	"	34701
	2878.823		1n		"	"	34726.5
2877.61		6n			"	"	34741.1
2875.9		4			"	"	34762
2875.22		4n			"	"	34769.9
2871.8		1n			"	10.1	34811
2870.4	2870.572	1	4		"	"	34826.2
2870.2		1			"	"	34831
	2868.783		0		"	"	34848.0
2867.06		4			"	"	34868.8
2866.1		2			"	"	34881
2865.22		4n			"	"	34891.2
2863.0		1			0.81	"	34918
2862.1		1			"	"	34929
2860.80		4n			"	"	34945.2
2859.5		1			"	"	34961
*2858.5		2n			"	"	34973
	2855.866		0		"	"	35005.5
2854.7	2854.781		0		"	"	35018.9
	2853.484		2		"	"	35034.8
2853.1	2853.207	2	4		"	"	35038.1
2852.3		1n			"	"	35049
2851.0		1n			"	"	35065
2849.8	2849.241		1		"	"	35087.0
2848.0	2848.406	1	0		"	10.2	35097.1
2845.5		1			"	"	35133
2844.4		1			"	"	35147
2842.1		2			"	"	35175
2840.0		1			"	"	35201
2839.1	2839.345	1	2		"	"	35209.1
2838.5		1			"	"	35220
2838.1	2837.643	1	0		"	"	35230.4
2837.3	2837.338	1	2		"	"	35234.1
2836.5		1			"	"	35245
2834.8	2834.815	1	0		"	"	35265.4
2831.6	2831.981	1	0		"	"	35300.8
2830.43	2830.402	4	8r		"	"	35320.5
2828.9		1			"	"	35339
2827.8		1			"	"	35353
2826.5		1			"	"	35369
2824.6	2825.192	1	1		"	"	35385.6

\* Double.

PLATINUM (SPARK AND ARC SPECTRA)—*continued.*

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
2823·3	2822·602	2	2		0·80	10·3	35409
2822·5		1n			"	"	35418·0
	2822·273		0		"	"	35422·1
	2821·179		0		"	"	35435·9
2819·0		1			"	"	35463
2818·6	2818·741	1	2		"	"	35466·5
2818·4	2818·354	1	4		"	"	35471·5
2817·3		2n			"	"	35485
2816·1		1			"	"	35500
2815·5		1			"	"	35507
2814·1	2814·121	2	0		"	"	35524·8
2813·5	2813·080	1	2		"	"	35537·9
	2810·921		0		"	"	35565·2
2809·7		2			"	"	35581
2808·9		2			"	"	35591
2808·7	2808·603	1	4		"	"	35594·6
2807·1	2807·396	1	0		"	"	35609·8
	2806·151		0		"	"	35625·7
2805·3		1n			"	"	35637
2803·5	2803·338	1	6		"	"	35661·4
2802·8		1			"	"	35668
2801·8		1			"	"	35681
2800·1	2800·560	1n	0		"	"	35696·3
2799·7		1			"	"	35708
2798·1		1n			"	10·4	35728
2797·8		2			"	"	35732
2795·5	2796·165	2	1		"	"	35752·8
2794·32	2794·304	6	5r		"	"	35776·7
2793·7	2793·736	2	2		"	"	35783·9
2793·3	2793·372	2	4		"	"	35788·7
2791·8		1n			"	"	35809
	2790·987		0		"	"	35819·2
	2790·593		0		"	"	35824·3
2789·8		1			"	"	35835
2789·5		1			"	"	35838
2788·6	2788·728	2	0		"	"	35848·2
2784·7		1			"	"	35900
2783·6		1			0·79	"	35914
2782·7		1			"	"	35926
2779·2		1			"	"	35971
	2777·558		0		"	"	35992·4
2777·0	2776·859	1	0		"	"	36001·5
	2776·111		1		"	"	36011·2
2774·88	2774·880	6	2		"	10·5	36027·1
	2774·306		3		"	"	36034·5
2774·0	2774·095	1	4		"	"	36037·2
2773·6	2773·696	2	2		"	"	36042·4
	2772·925		4		"	"	36052·4
2771·78	2771·750	4	4r		"	"	36067·8
2769·8	2769·940	1	4		"	"	36091·4
2769·0		1			"	"	36101
2767·4		1			"	"	36125
2766·6	2766·764	1	5		"	"	36132·9
2764·2		1n			"	"	36166
2763·30	2763·299	4	0		"	"	36178·1

PLATINUM (SPARK AND ARC SPECTRA)—*continued*.

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
2761·5		1			0·79	10·5	36202
2759·8	2759·424	1	0		"	"	36229·0
2758·7	2758·333	1	2		"	"	36243·3
	2758·164		0		"	"	36245·6
2757·5	2757·799	2n	2		"	"	36250·3
2755·7		1			"	"	36278
2755·03	2755·003	4	4		"	"	36287·1
	2754·327		0		"	"	36296·0
	2753·957		3		"	"	36300·8
2753·8	2753·850	2	2		"	"	36302·3
2753·3		1			"	"	36310
2753·1		1			"	"	36312
2752·6		1			"	"	36319
2752·0		1			"	"	36327
2751·4		1			"	"	36335
2750·0		1			"	10·6	36353
2749·3		2			"	"	36362
2747·7	2747·701	2	4		"	"	36383·5
2747·0		1			"	"	36393
2746·6		1			"	"	36398
2745·4		1			"	"	36414
2745·0	2744·928	1	2		"	"	36420·2
2743·5		1b			"	"	36439
2742·4		1			"	"	36454
2741·5		1n			0·78	"	36466
2740·5		1n			"	"	36479
2739·6		1			"	"	36491
2738·5	2738·569	2	4		"	"	36505·8
2737·6	2737·656	1	2		"	"	36516·9
	2736·886		0		"	"	36527·2
2735·8		2			"	"	36542
2734·5	2734·584	1	2		"	"	36558·1
2734·08	2734·057	4n	8r		"	"	36565·0
	2733·725		5r		"	"	36569·5
2732·1		1n			"	"	36591
2729·9	2730·002	1	5		"	"	36619·4
2727·5		1			"	"	36653
2726·55		4			"	10·7	36666
	2725·433		2		"	"	36680·8
2721·8		1			"	"	36730
2721·1		1			"	"	36739
2719·7		2			"	"	36758
2719·20	2719·125	4	6r		"	"	36765·8
2717·75	2717·709	4	0		"	"	36785·0
2715·8	2715·866	1	2		"	"	36809·9
	2714·613		0		"	"	36827·0
2713·1	2713·215	2	4		"	"	36845·9
2711·0		2			"	"	36876
2708·0		1			"	"	36917
2707·3		1			"	"	36927
2706·05	2705·985	4	5r		"	"	36944·4
2704·5		1			"	"	36965
2704·1		1			"	"	36970
2702·50	2702·484	6	6r		"	10·8	36992·2
2701·2	2701·208	1	0		"	"	37009·6



PLATINUM (SPARK AND ARC SPECTRA)—*continued.*

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
2699.5		1			0.78	10.8	37033
2698.55	2698.498	4	6		0.77	"	37046.8
2697.3		1n			"	"	37063
	2696.069		0		"	"	37080.2
2694.3	2694.314	1	4		"	"	37104.5
2694.1		1			"	"	37107
2692.3		2			"	"	37132
2689.5		2			"	"	37171
	2688.352		2		"	"	37186.7
	2686.990		0		"	"	37205.6
2681.9		1			"	"	37276
2680.2		1			"	"	37300
2679.3		2			"	"	37312
2677.3	2677.232	2	5r		"	10.9	37341.1
2677.0		1			"	"	37344
2676.2		1			"	"	37356
2674.8	2674.649	2	4		"	"	37377.2
	2673.707		0		"	"	37390.3
2672.8		1			"	"	37403
2668.8	2668.748	1n	0		"	"	37459.8
2666.8		1			"	"	37487
2664.8	2664.723	1	2		"	"	37516.5
2662.0		1			"	"	37555
2661.6		1			"	"	37561
2659.60	2659.535	6	10r		"	"	37589.6
2658.8	2658.790	1	2		"	"	37600.2
2658.2	2658.266	1	4		"	"	37607.5
2657.8		1			"	"	37614
	2656.907		0		"	"	37626.8
	2653.867		0		0.76	11.0	37669.8
2651.5		1			"	"	37704
2651.00	2650.938	4	4r		"	"	37711.5
2647.00	2646.969	4	6r		"	"	37768.0
2645.4	2645.453	1	4		"	"	37789.7
2639.8	2639.434	1	5		"	"	37876.0
2639.3		2			"	"	37878
2635.7	2635.372	1	0		"	"	37934.3
2634.9		2			"	"	37941
2631.2		1			"	11.1	37994
2628.13	2628.122	6	7r		"	"	38038.9
2627.5	2627.484	1	4		"	"	38048.2
2625.41	2625.419	6	2		"	"	38078.0
2623.1		1n			"	"	38112
2621.5		1			"	"	38135
2620.9		1			"	"	38144
2619.6	2619.977	2n	0		"	"	38157.1
	2619.668		4		"	"	38161.6
2616.75	2616.839	4	0		"	"	38202.5
	2614.701		2		"	"	38234.2
2613.8	2613.337	1n	0		"	"	38254.1
	2613.204		0		"	"	38256.2
2612.7		1			"	"	38264
2611.8		1			"	"	38277
2611.2		1			0.75	"	38286
2608.8		1			"	11.2	38321

PLATINUM (SPARK AND ARC SPECTRA)—*continued*.

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Keyser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
2608.0	2608.333	1n	0		0.75	11.2	38327.5
2607.0		1n				"	38347
	2606.126		0		"	"	38359.9
2603.5		1			"	"	38399
2603.2	2603.223	1	4		"	"	38402.8
	2602.182		0		"	"	38418.1
2600.2	2599.986	1n	2		"	"	38450.5
2599.4	2599.148	1	0		"	"	38462.9
2598.2		1			"	"	38477
2595.8	2596.081	2	4		"	"	38508.4
2595.3		1			"	"	38520
2590.8		1			"	"	38587
	2587.890		2		"	11.3	38630.2
2585.8		1			"	"	38662
2582.9	2582.415	1	2		"	"	38712.1
2579.4		1			"	"	38757
2578.9		1			"	"	38765
2578.1		2			"	"	38777
2577.0		1n			"	"	38794
2574.7	2574.580	1	2		"	"	38829.8
2574.2		1			"	"	38836
2572.70	2572.723	4	0		"	"	38858.1
2568.4		2			"	11.4	38923
2566.1		1			"	"	38958
2564.0	2564.263	1	0		0.74	"	38986.2
2562.5		1			"	"	39013
2560.4	2560.438	1	0		"	"	39044.4
2556.9		1			"	"	39099
2555.6		1			"	"	39118
2554.8		1			"	"	39131
2552.6		1			"	"	39164
2552.2	2552.326	1	3		"	"	39168.5
2549.4	2549.552	1n	3		"	"	39211.2
	2548.194		0		"	11.5	39232.0
	2546.986		0		"	"	39250.5
	2546.562		0		"	"	39257.2
	2544.807		2		"	"	39284.2
2544.0	2544.042	1	4		"	"	39296.1
2542.8		1			"	"	39315
2541.3	2541.433	1	2		"	"	39336.4
2539.1	2539.285	1n	3		"	"	39369.6
	2538.361		0		"	"	39384.0
2536.4	2536.581	1n	4		"	"	39411.7
	2536.063		2		"	"	39419.6
2534.5		1			"	"	39444
2533.0		1			"	"	39467
2531.9		1			"	"	39485
	2529.499		2		"	11.6	39521.9
2526.0		1			"	"	39577
2524.4		1n			"	"	39602
2523.6		1			"	"	39614
	2522.616		0		"	"	39631.3
2520.6	2520.356	1	0		"	"	39665.3
2519.0		1			"	"	39687
	2517.273		1		0.73	"	39714.0

PLATINUM (SPARK AND ARC SPECTRA)—*continued.*

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Kayser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
2515·6	2515·666	2	3		0·73	11·6	39739·2
2515·1	2515·119	1	3		"	"	39747·9
	2514·165		2		"	"	39763·0
2513·98	2513·999	6	0		"	"	39765·7
2512·6		1			"	"	39788
2512·0		1			"	"	39797
	2510·604		0		"	11·7	39819·4
2508·5	2508·589	1	3		"	"	39851·3
2505·9	2506·014	1n	4		"	"	39892·4
	2504·128		2		"	"	39922·3
	2503·075		2		"	"	39939·1
	2500·895		0		"	"	39973·9
	2498·592	2	4		"	"	40010·9
2498·0		1			"	"	40020
2497·3	2497·197	1n	1		"	"	40033·2
2495·95	2495·910	4	4		"	"	40053·8
2493·1		1			"	11·8	40099
2492·6		1			"	"	40107
2491·5		1			"	"	40125
2490·1	2490·217	2	2		"	"	40145·3
2489·7		1			"	"	40154
2489·00	2488·819	4	4		"	"	40167·9
2487·15	2487·216	6	4r		"	"	40193·7
2483·4	2483·452	1	2		"	"	40254·8
2482·10	2483·312	4	2		"	"	40256·9
2481·3	2481·270	1n	2		"	"	40290·1
2480·6		1			"	"	40301
2480·2		1			"	"	40308
2479·1		1			"	"	40325
	2477·365		0		"	"	40353·6
2476·0		1			"	11·9	40376
2475·3		1			"	"	40387
	2473·247		0		"	"	40420·7
2472·0		1n			"	"	40441
2470·9	2471·092	1n	3		"	"	40456·1
2469·4	2469·537	1n	0		0·72	"	40481·5
2467·70	2467·504	6	6r		"	"	40514·9
2462·5		1n			"	"	40597
2461·1	2461·474	1	0		"	"	40614·2
	2460·160		1		"	"	40635·9
2458·9		1n			"	12·0	40657
2455·2		1			"	"	40718
2451·0	2451·046	1	3		"	"	40786·8
2450·58	2450·527	4	2		"	"	40795·5
2445·5		1			"	"	40879
2444·5		1n			"	"	40896
2443·2		1			"	12·1	40918
2442·75		4			"	"	40925·4
2440·1	2440·158	2	4r		"	"	40968·8
	2439·533		1		"	"	40979·4
2436·7	2436·771	1	4r		"	"	41025·8
2434·62	2434·551	4	0		"	"	41063·3
2433·6		1			"	"	41079
2432·9		1			"	"	41091

PLATINUM (SPARK AND ARC SPECTRA)—*continued*.

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Keyser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
2432.0		1			0.72	12.1	41106
2429.4	2429.186	1n	2		"	"	41153.9
2428.2	2428.206	1n	8r		"	12.2	41170.4
2426.7	2426.523	1	2		"	"	41199.1
2425.03	2424.964	6	2		"	"	41225.6
2423.3		1			"	"	41254
2422.6		1n			"	"	41266
2421.00	2420.912	4	0		0.71	"	41294.6
2418.1	2418.151	2	3		"	"	41341.7
2417.9		1			"	"	41346
2415.0		1			"	"	41396
2413.3	2413.138	1n	1		"	"	41427.6
2412.1		1n			"	12.3	41445
2410.4		1n			"	"	41475
2406.7		1			"	"	41538
2405.7		1n			"	"	41556
2405.0		1			"	"	41568
	2403.180		4r		"	"	41599.2
2403.1		1n			"	"	41601
	2401.959		3		"	"	41620.4
2401.1	2401.089	1	1		"	"	41635.4
2400.4		1			"	"	41647
2396.72	2396.762	4	0		"	12.4	41710.6
2396.2	2396.243	1	2		"	"	41719.7
2395.6		1			"	"	41731
	2391.856		0		"	"	41796.1
2390.8		1			"	"	41815
2389.7	2389.615	1	3		"	"	41835.3
2387.4	2387.448	1	0		"	"	41873.3
2386.6	2386.886	1n	0		"	"	41883.1
2384.4		1n			"	"	41927
2383.7	2383.732	1	4		"	"	41938.7
2382.0		1			"	12.5	41969
2381.4		1			"	"	41980
	2380.035		0		"	"	42003.6
2379.0		1			"	"	42022
2377.28		6			"	"	42052.4
2375.7		1			"	"	42080
2375.1		1			"	"	42091
2374.8		1			"	"	42096
2373.4		1			0.70	"	42121
2373.0		1			"	"	42128
2371.7		1			"	"	42151
2369.9		1			"	"	42183
2368.4	2368.357	1	4r		"	12.6	42210.7
2368.1		1			"	"	42215
2366.6		1			"	"	42242
2365.5		1			"	"	42262
2364.8		1			"	"	42274
2364.0		1			"	"	42289
2357.7	2357.656	1	0		"	"	42402.3
2357.2	2357.181	1n	4r		"	"	42411.0
2356.4	2356.415	1	0		"	"	42424.7
	2353.123		0		"	12.7	42484.1



PLATINUM (SPARK AND ARC SPECTRA)—*continued*.

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Keyser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
2351.5		1			0.70	12.7	42513
2348.6		1			"	"	42566
	2347.239		0		"	"	42590.5
	2346.822		0		"	"	42598.2
2343.4	2343.468	1	0		"	"	42659.1
2342.8		1			"	"	42671
2340.2	2340.255	1	2		"	12.8	42717.5
2339.5		1			"	"	42731
2339.1		1			"	"	42739
2335.2		1			"	"	42810
2326.4	2326.185	1n	2		"	12.9	42975.9
2323.2		1			0.69	"	43031
2320.1		1n			"	"	43089
2318.3	2318.371	1	2		"	"	43020.9
2315.4	2315.58	1n	2		"	"	43072.8
2314.2		1			"	13.0	43199
2313.7		1			"	"	43208
2312.9		1n			"	"	43223
2310.9		2			"	"	43260
2308.1	2308.12	1n	3		"	"	43312.3
2307.8		1			"	"	43318
2306.3		1			"	"	43347
2305.8	2305.72	1	2		"	"	43357.4
2304.6		1			"	"	43379
2304.3		1			"	"	43384
2302.5		1			"	"	43418
2297.5		1			"	13.1	43513
2296.1		2			"	"	43539
2293.7		1			"	"	43585
2292.8		1			"	"	43602
2292.0		1			"	"	43617
2291.7		1			"	"	43623
2289.6		1			"	"	43663
2288.4		4n			"	13.2	43686
2287.7		2			"	"	43699
2286.8		1			"	"	43716
2285.9		1			"	"	43733
2285.3		1			"	"	43745
2281.6		1			"	"	43816
2280.9		1			"	"	43829
2276.4		1			0.68	"	43917
2274.6		1n			"	13.3	43951
2271.9		1			"	"	44003
2270.1		1n			"	"	44038
2269.1		1			"	"	44057
2268.5		1			"	"	44069
2267.5		1			"	"	44088
2266.7		1n			"	"	44104
2264.3		1n			"	"	44151
2263.6		1			"	"	44164
2263.0		1			"	13.4	44176
2259.8		1			"	"	44238
2259.0		1			"	"	44254
2256.4		1n			"	"	44305

PLATINUM (SPARK AND ARC SPECTRA)—*continued.*

Wave-length		Intensity and Character		Previous Observations (Ångström)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek Spark	Keyser Arc	Spark	Arc		$\lambda +$	$\frac{1}{\lambda} -$	
2254·8		1			0·68	13·4	44336
2253·3		1			"	"	44366
2251·6		2			"	"	44400
2250·7		1			"	13·5	44417
2247·4		1n			"	"	44482
2245·6		1n			"	"	44518
2242·7		1n			0·67	"	44576
2235·4		1n			"	13·6	44721
2229·1		1			"	"	44848
2218·4		1n			"	13·7	45064
2210·4		1n			"	13·8	45227
2210·0		1			"	"	45235
2205·1		1			"	"	45336
2204·0		1			"	"	45358
2202·0		1			"	13·9	45399
2192·4		1n			0·66	14·0	45598
2190·4		1n			"	"	45640
2177·0		1			"	14·1	45921
2150·4		1			"	14·3	46489
2149·8		1			"	"	46502
2148·9		1			"	"	46521
2144·4		1n			0·65	14·4	46619
2130·7		1			"	14·5	46918

CORONIUM.—5316·9.

MONIUM.—3120, 3117; and fainter lines at 3219, 3064, 3060.

NEON.—5400, 5030.

KRYPTON.—Ramsay and Travers, 5870·0, 5570·0, 5561·8; Runge, 5871·10, 5570·40, 5562·35; and fainter lines at 6011, 5829, 4909, 4834, 4830, 4807, 4736, 4671, 4461, 4387, 4317.

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# APPENDIX K.

## CHLORINE (VACUUM-TUBE).

Eder and Valenta: 'Denkschr. kais. Akad. Wissensch. Wien,' Bd. lxxviii. 1899.

S. = Salet; P. = Plücker; T. = Thalén; H. = Hasselberg.

Pressure 10 to 20 mm.		Pressure 30 to 40 mm.		Pressure 70 to 100 mm.	Previous Measure- ments (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Wave- length (Rowland) (a)	Inten- sity and Cha- racter	Wave- length (Row- land) (b)	Inten- sity and Cha- racter	Inten- sity and Cha- racter		$\lambda +$	$\frac{1}{\lambda}$	
		5672.2	$\frac{1}{2}$		5670.3 P.	1.55	4.8	17625
		35.1	1b	b	5636.4 P.	1.54	"	741
		25.5	$\frac{1}{2}$			1.53	"	71
		23.1	$\frac{1}{2}$			"	"	79
		5580.1	$\frac{1}{2}$		5597.5 P., also T.	1.52	4.9	916
		70.4	$\frac{1}{2}$		73.7 P.	"	"	47
		—	n		38.0 P.	"	"	
5457.70	$\frac{1}{2}$ s	57.70	$\frac{1}{2}$ b <sup>v</sup>	b	5457.8 H., also S.P.T.	1.49	"	{ 18317.8a
57.28	3s	57.30	3b <sup>v</sup>					
56.391	2s	56.49	2b <sup>v</sup>					
45.12	1s	45.1	1n	b	45.0 H., also S.P.T.	"	5.0	{ 60.2a
44.412	3s	44.52	4b <sup>v</sup>					
43.587	5s	43.64	6b <sup>v</sup>					
23.703	2s	23.7	4b <sup>v</sup>	b	24.6 H., also S.P.T.	1.48	"	{ 432.6a
23.441	6s	23.4	10b <sup>v</sup>					
5392.300	4s	92.3	6b					
		5285.8	$\frac{1}{2}$		5393.7 H., also S.P.T.	1.47	5.1	539.9a
5221.48	4s	21.54	6b	b	5285.9 H., also P. T.	"	"	913
18.07	3s	18.16	8b <sup>v</sup>	b	20.8 H., also S.P.T.	1.44	5.2	19146.5a
		5193.6	$\frac{1}{2}$ n		17.0 H., also P. T.	1.43	"	59.0a
		89.74	1b		5195.6 P., also T.	1.42	5.3	249
		76.0	$\frac{1}{2}$		89.8 H., also P. T.	"	"	63.5
		73.4	1n		78.1 P., also T.	"	"	315
		—			73.2 H., also P. T.	1.41	"	24
		62.50	1		61.6 H., also P. T.	"	"	—
		58.9	$\frac{1}{2}$ n		63.7 P.	"	"	65.2
		13.3	1n			"	"	79
5103.18	2s	03.18	4b		13.6 H., also P. T.	1.40	5.4	551
		5099.36	1b <sup>v</sup>		03.0 H., also P. T.	"	"	90.2a
		89.6	$\frac{1}{2}$ n		5098.8 H., also S.P.T.	1.39	"	604.9
		83.59	1			"	"	43
5078.361	4s	78.38	4b <sup>v</sup>		78.3 H., also S.P.T.	1.38	"	65.7
		4995.7	1n		4998.7 H., also S.P.T.	1.37	5.5	86.0a
		70.3	1n		73.3 H., also S.P.T.	1.36	"	20012
		43.1	$\frac{1}{2}$		46.2 H., also P. T.	1.35	5.6	114
		—			39.0 H., also P. T.	"	"	225



CHLORINE (VACUUM-TUBE)—*continued.*

Pressure 10 to 20 mm.		Pressure 30 to 40 mm.		Pressure 40 to 100 mm.	Previous Measure- ments (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Wave- length (Rowland) (a)	Inten- sity and Char- acter	Wave- length (Row- land) (b)	Inten- sity and Char- acter	Inten- sity and Char- acter		$\lambda +$	$\frac{1}{\lambda}$	
		4927.3	$\frac{1}{2}$				5.6	20289
		24.90	1n		4926.1 H., also S.P.T.	1.35	"	99.4
4917.870	2s	17.84	3b		17.5 T., also P.	"	"	328.4a
04.905	4s	04.85	4b <sup>v</sup>		05.4 H., also S.P.T.	1.34	"	82.2a
4896.905	5s	4896.90	5b <sup>v</sup>		4897.6 H., also S. T.	"	"	415.5a
19.628	9s	19.63	9b		20.3 H., also S.P.T.	1.32	5.7	742.8a
10.194	9s	10.19	9b		10.5 H., also S.P.T.	"	"	83.5a
4794.665	10s	4794.62	10b		4794.5 H., also S.P.T.	1.31	"	850.8a
85.41	$\frac{1}{2}$ s	85.5	1n				"	91.1a
81.49	5s	81.44	5s		83.4 P., also S.	"	5.8	908.2a
79.06	3s	79.07	3s		81.8 H., also P. T.	"	"	18.8a
71.22	2s	71.19	2n		74.6 P.	"	"	53.2a
68.80	4s	68.76	4s		70.0 H., also S.P.T.	"	"	63.8a
		55.9	1n		54.0 P.	1.30	"	21021
40.505	3s	40.52	3b <sup>v</sup>		40.5 H., also S.P.T.	"	"	89.0a
		4661.38	1s		4660.9 T.	1.28	5.9	447.0
		54.3	1		48.8 T.	1.27	"	80
		49.1	$\frac{1}{2}$		40.9 T., also P.	"	"	504
		24.23	3b		28.3 P.	"	6.0	619.2
		01.19	4b <sup>v</sup>		07.2 P., also T.	1.26	"	727.5
		—			4595.8 P., also T.	"	"	—
		4585.05	1n		90.7 P., also S. T.	"	"	804.0
		72.79	5b		72.1 P.	1.25	"	62.5
		70.16	3		66.5 P.	"	"	75.1
		37.0	$\frac{1}{2}$		37.0 P.	1.24	6.1	22035
		26.44	5b <sup>v</sup>		26.0 P., also T.	"	"	86.3
		19.4	$\frac{1}{2}$			"	"	121
		10.6	$\frac{1}{2}$			"	"	64
		04.50	$\frac{1}{2}$		05.6 P.	1.23	"	93.9
		4497.45	$\frac{1}{2}$		4497.2 P.	"	"	228.7
		91.25	3b			"	6.2	59.3
		90.16	3b		90.4 P.	"	"	64.7
		75.498	4s	b <sup>v</sup>		"	"	337.7
		69.569	5s	s		"	"	67.3
4446.348	2s	46.30	2s	b		1.22	"	481.2a
46.096	2s	46.10	2s	b		"	"	85.4
38.735	4s	38.72	2s	b <sup>v</sup>		"	"	522.8a
		17.0	$\frac{1}{2}$ n			1.21	6.3	634
03.210	5s	03.22	5s	b <sup>v</sup>		"	"	704.4a
02.672	1s	02.79	4b			"	"	07.2a
		4399.765	1b			"	"	22.2
		99.373	2b			"	"	24.2
4391.12	$\frac{1}{2}$					1.20	"	66.9
90.566	3s	90.572	3s	s		"	"	69.8a
89.949	8s	89.941	6s	b <sup>v</sup>		"	"	73.0a
87.730	5s	87.791	2			"	"	84.5a
80.075	8s	80.097	5s	s		"	"	824.3a
73.119	6s	73.111	8s	b		"	"	60.7a
71.715	5s	71.740	2			"	"	68.0a
69.676	6s	69.690	6s	s		"	"	78.7a
63.457	8s	63.462	5s	b <sup>v</sup>		"	6.4	911.2a

CHLORINE (VACUUM-TUBE)—*continued.*

Pressure 10 to 20 mm.		Pressure 30 to 40 mm.		Pressure 70 to 100 mm.	Previous Measure- ments (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Wave- length (Rowland) (a)	Inten- sity and Cha- racter	Wave- length (Row- land) (b)	Inten- sity and Cha- racter	Inten- sity and Cha- racter		$\lambda +$	$\frac{1}{\lambda}$	
4343.822	10s	4343.82	10sr		4347.1 P., also S.	1.19	6.4	23014.8
36.371	5s	36.39	5s	s	39.4 P.	"	"	54.4a
		33.125	1			"	"	71.7
23.523	6s	23.54	4s	b <sup>v</sup>	13.7 P., also S.	1.18	"	122.9a
09.189	3s	09.19	4b	b		"	6.5	99.8a
07.593	6s	07.627	8s	s		"	"	208.3a
04.211	4s	04.20	6s	s		"	"	26.6a
4291.861	5s	4291.884	6s	s	4295.6 P.	"	"	93.4a
80.615	3s				82.6 P.	1.17	"	354.7
76.628	4s	76.719	3b <sup>v</sup>	b <sup>v</sup>	78.8 P.	"	"	76.4a
70.725	3s	70.855	2b <sup>v</sup>	b <sup>v</sup>		"	"	408.7a
64.740	3s	64.769	2s	n		"	"	41.6a
61.350	3s	61.421	4b	b		"	"	60.2a
59.628	4s	59.640	5s	s	59.7 P., also S.	"	"	69.7a
53.532	9s	53.638	10b <sup>v</sup>	b <sup>v</sup>		"	6.6	503.3a
41.435	8s	41.474	8b <sup>v</sup>	b <sup>v</sup>		1.16	"	70.3a
35.608	3s	35.683	4b <sup>v</sup>			"	"	602.8a
34.137	5s	34.198	5b <sup>v</sup>			"	"	10.9a
26.580	7s	26.585	4s	s		"	"	53.2a
		25.139	1			"	"	61.3
09.866	5s	09.861	4s			"	"	747.1a
08.160	4s	08.209	3b <sup>v</sup>	b		"	"	56.8a
		4189.379	1n			1.15	6.7	863.2
4158.021	4s	58.001	5b			1.14	"	24043.2a
		49.631	1n			"	"	91.8
47.203	4s	47.356	5b <sup>v</sup>	b <sup>v</sup>		"	6.8	105.9a
33.834	3s	33.955	3			"	"	83.8a
32.680	8s	32.719	9b <sup>v</sup>	b <sup>v</sup>	4130.8 S.	"	"	90.1a
30.991	4s	31.088	4b <sup>v</sup>			1.13	"	200.5a
30.34	1n	30.304	1n	b <sup>v</sup>		"	"	04.3a
		24.153	1n			"	"	40.6
04.965	4s					"	"	354.0
		4054.242	2n			1.11	6.9	658.6
		40.710	2n			"	7.0	741.1
4032.330	5s	32.368	3s			"	"	92.6a
		3991.625	1n			1.10	7.1	25045.4
		82.060	3n			"	"	105.5
		61.770	2n			1.09	"	234.1
		55.582	3n			"	7.2	73.5
3917.721	2s	17.762	4s	b <sup>v</sup>		1.08	"	517.9a
16.832	4s	16.870	5s	b <sup>v</sup>		"	"	23.6a
14.055	5s	14.105	6b <sup>v</sup>	b <sup>v</sup>		"	"	41.7a
		3884.045	2b	b <sup>v</sup>		1.07	7.3	739.1
		83.454	2*	s		"	"	43.0
		71.537	4b	b		"	"	822.2
		68.844	6s	b <sup>v</sup>		"	"	40.2
		66.103	1s			"	"	58.6
		63.726	2b			"	"	74.4
3861.008	10s	61.006	10s	b <sup>v</sup>		"	"	92.7

\* Possibly not due to Chlorine.

CHLORINE (VACUUM-TUBE)—*continued*.

Pressure 10 to 20 mm.		Pressure 30 to 40 mm.		Pressure 50 to 100 mm.	Previous Measure- ments (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Wave- length (Rowland) (a)	Inten- sity and Cha- racter	Wave- length (Row- land) (b)	Inten- sity and Cha- racter	Inten- sity and Cha- racter		$\lambda +$	$\frac{1}{\lambda}$	
		3858.83	$\frac{1}{2}$			1.07	7.3	25907.3
		55.738	2s	s		1.06	"	28.1
		55.000	4b			"	"	33.0
		54.21	1n			"	"	38.4
		53.63	1n			"	"	42.3
51.751	1n	51.8	1n	} b <sup>v</sup>		"	"	54.9a
51.531	8s	51.536	8s			"	"	56.4a
51.165	10s	51.172	10s			"	"	58.8a
		49.299	2s			"	"	71.5
		48.034	2s			"	"	80.0
45.825	8s	45.83	8s	} b <sup>v</sup>		"	"	94.9a
45.545	8s	45.56	5s			"	"	96.8a
43.390	5s	43.398	5s			"	"	26011.4a
		38.482	3s			"	"	44.7
		36.658	2s			"	"	57.0
33.502	8s	33.510	6b <sup>v</sup>	b <sup>v</sup>		"	"	78.5a
		30.962	2n			"	"	95.8
		29.550	2n			"	"	105.4
		27.802	5			"	"	17.4
		21.850	1			"	"	58.0
		20.404	5			"	"	68.0
		18.577	3			"	"	80.4
		10.215	2b			1.05	7.4	237.9
		09.697	4			"	"	41.4
		05.384	6			"	"	71.2
		00.105	1			"	"	307.7
		3798.991	5b <sup>v</sup>			"	"	15.4
		87.262	1n			"	"	96.9
		81.378	5s			"	"	438.0
		74.324	4			1.04	"	87.4
		73.813	2			"	"	91.0
		69.187	1s			"	7.5	523.4
		68.228	3s			"	"	30.2
		67.647	4s			"	"	34.2
		50.102	5s	s		"	"	658.5
		48.594	2s	b <sup>v</sup>		"	"	69.2
		43.206	1			"	"	707.5
		26.688	3s	} b		1.03	7.6	825.9
		25.912	3s			"	"	31.5
		22.4	1n			"	"	57
		20.4	1n			"	"	71
		07.4	1n			"	"	965
		05.5	1n			"	"	979
		3689.1	1n			1.02	"	27099
		83.6	1n			"	"	140
		82.1	1n			"	"	51
		73.9	1n			"	"	211
		68.1	1n			"	"	54
		63.948	2s			"	7.7	85.3
		59.913	2s			"	"	315.1
		58.499	3s			"	"	25.9

CHLORINE (VACUUM-TUBE)—*continued*.

Pressure 10 to 20 mm.		Pressure 30 to 40 mm.		Pressure 70 to 100 mm.	Previous Measure- ments (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Wave- length (Rowland) (a)	Inten- sity and Char- acter	Wave- length (Row- land) (b)	Inten- sity and Char- acter	Inten- sity and Char- acter		$\lambda +$	$\frac{1}{\lambda} -$	
		3650.243	4s	b		1.01	7.7	27387.8
		24.3	$\frac{1}{2}n$			"	"	534
		22.7	$\frac{1}{2}n$			"	7.8	96
		13.9	2n			"	"	663
		02.2	2s			"	"	753
		3577.211	1			"	7.9	954.7
		68.08	3b			"	"	28018.4
		22.04	$\frac{1}{2}$			"	8.0	384.6
		09.09	$\frac{1}{2}$			"	8.1	489.3
		3479.82	1			"	"	729.0
		3353.45	5s			"	8.5	29811.5
		33.74	2s			"	"	987.8
		29.14	5b			"	"	30029.3
		16.83	$\frac{1}{2}$			"	8.6	140.7
		15.49	4b			"	"	52.9
		07.90	1b			"	"	222.1
		06.44	3b			"	"	35.4
		3276.79	1n			"	"	509.8

## MOLYBDENUM.

Exner and Haschek: 'Sitzber. kais. Akad. Wissensch. Wien,' civ. 1895,  
cv. 1896.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
5060.0	1n	1.38	5.4	19757
00.5	1b	1.37	5.5	992
4979.0	1n	1.36	"	20079
64.0	1n	"	"	139
57.5	1n Fe	"	"	66
50.5	1n	1.35	"	94
41.4	1n	"	5.6	232
33.0	1n	"	"	66
26.2	1	"	"	94
09.0	1n	1.34	"	365
07.0	1n	"	"	73
03.5	1n	"	"	88
4886.5	1n	"	"	459
84.5	1n	"	"	67
78.0	1n	1.33	"	95
67.8	4	"	"	538
60.0	1n	"	5.7	70
58.1	1n	"	"	78



MOLYBDENUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4853.5	2n	1.33	5.7	20598
44.8	1n	"	"	635
43.7	1n	"	"	40
39.2	1n	1.32	"	59
33.7	1	"	"	82
32.5	1n	"	"	87
30.4	4	"	"	96
19.0	4	"	"	745
10.9	2	"	"	80
07.8	1n	"	"	94
05.5	1n	"	"	804
02.8	1n	1.31	"	15
4798.0	1n	"	"	36
96.3	1	"	"	44
93.2	1	"	"	57
92.6	1	"	"	60
88.0	1n	"	"	80
86.5	1n	"	"	86
85.0	1	"	"	93
82.8	1	"	5.8	902
76.0	1	"	"	32
75.4	1	"	"	35
73.3	1	"	"	44
70.5	1n	"	"	56
69.3	1	"	"	62
63.3	1	1.30	"	88
61.8	1	"	"	95
59.9	6	"	"	21003
54.0	1n	"	"	29
50.2	2	"	"	46
44.3	1	"	"	72
42.3	4	"	"	81
40.0	1n	"	"	91
35.2	1n	"	"	113
33.0	1	"	"	22
31.3	4	"	"	30
30.4	1	"	"	34
29.0	1	1.29	"	40
28.1	1	"	"	44
25.0	1	"	"	58
23.0	1	"	"	67
18.8	1	"	"	86
17.8	2	"	"	90
16.8	1	"	"	95
14.3	1	"	"	206
12.7	1	"	"	13
08.2	1	"	"	34
07.3	4	"	5.9	38
06.1	2	"	"	43
00.3	1	"	"	69
4699.1	1b	"	"	75
96.0	1	"	"	89
93.9	1	"	"	98
90.9	1	1.28	"	312
90.1	1	"	"	16

MOLYBDENUM—*continued.*

Wave length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4689.4	1	1.28	5.9	21319
88.2	2	"	"	24
87.3	1	"	"	28
85.8	1	"	"	35
83.8	1	"	"	44
81.8	1	"	"	53
80.6	1b	"	"	59
73.7	1	"	"	90
71.8	2	"	"	99
67.3	1n	"	"	420
62.9	2	"	"	40
61.7	1	"	"	45
60.8	1	"	"	50
59.9	1 W	"	"	54
57.7	1	"	"	64
56.3	1	"	"	70
53.2	1	1.27	"	85
52.5	1	"	"	88
50.8	1	"	"	96
47.8	1	"	"	510
38.1	2	"	"	55
36.1	1	"	"	64
35.0	1	"	6.0	69
34.4	1	"	"	72
33.2	1	"	"	77
27.9	1	"	"	602
26.7	2	"	"	08
23.8	1	"	"	21
23.1	1	"	"	24
22.7	1	"	"	26
21.3	1	"	"	33
21.0	1n	"	"	34
20.6	1n	"	"	36
19.5	1n	"	"	41
18.1	1	"	"	48
16.6	1	1.26	"	55
14.7	1	"	"	64
13.4	1	"	"	70
12.9	1n	"	"	72
11.4	1n	"	"	79
10.8	1n	"	"	82
10.1	4	"	"	85
09.1	1n	"	"	90
04.6	1	"	"	711
03.8	1	"	"	15
4599.3	1	"	"	36
98.5	1	"	"	40
98.1	1	"	"	42
95.3	2	"	"	55
93.7	1	"	"	63
92.3	1	"	"	70
88.3	1	"	"	89
87.5	1n	"	"	92
87.0	1	"	"	95
86.8	1	"	"	96

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
4586.3	1	1.26	6.0	21798
84.5	1n	"	"	807
82.7	1	"	"	15
81.1	1	"	"	23
80.1	1	1.25	"	28
79.0	1	"	"	33
78.2	1	"	"	37
76.8	2	"	"	43
76.2	1n	"	"	46
75.6	1	"	"	49
74.8	1	"	"	53
70.2	1	"	"	75
69.2	1	"	"	80
67.9	1	"	"	86
66.1	1	"	"	94
64.9	1	"	6.1	900
60.4	1	"	"	22
60.1	1	"	"	23
58.9	1	"	"	29
58.3	1	"	"	32
53.5	6	"	"	55
49.5	1b	"	"	74
48.1	1n	"	"	81
46.4	1b	"	"	89
43.8	1	"	"	92
41.8	1	1.24	"	22012
41.0	1n	"	"	15
38.8	1	"	"	26
37.1	4	"	"	34
36.1	2	"	"	39
35.6	1	"	"	42
35.1	1	"	"	44
34.8	4	"	"	46
31.3	1	"	"	62
29.6	1	"	"	71
28.8	1	"	"	75
26.7	1	"	"	85
25.8	1	"	"	89
24.5	2	"	"	96
23.9	1	"	"	99
22.5	1	"	"	106
21.2	1n	"	"	12
19.8	1	"	"	19
18.6	1n	"	"	25
17.2	2	"	"	31
16.6	1	"	"	34
15.5	1	"	"	40
14.6	1	"	"	44
12.5	2	"	"	55
11.4	1	"	"	60
08.8	1n	"	"	73
06.9	1	"	"	82
06.1	2	"	"	86
05.5	1	1.23	"	89
03.8	1	"	"	97

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4501.5	1	1.23	6.1	22209
4499.8	1	"	"	13
98.5	1	"	"	17
94.7	1n	"	"	23
94.2	1n	"	6.2	42
93.8	2n	"	"	45
91.9	1	"	"	47
91.6	4	"	"	56
90.6	1	"	"	58
89.6	1	"	"	62
89.2	1	"	"	67
87.3	1	"	"	69
85.3	2	"	"	79
84.4	1	"	"	89
81.7	1	"	"	93
79.1	1	"	"	307
75.9	1	"	"	20
74.9	6	"	"	36
73.5	2	"	"	41
72.3	2n	"	"	48
72.0	1	"	"	54
68.5	2	1.22	"	55
67.8	1	"	"	73
65.6	1	"	"	76
65.2	1	"	"	87
64.2	1	"	"	89
62.1	1	"	"	94
60.8	1	"	"	405
58.8	1	"	"	11
57.7	4	"	"	21
56.3	1	"	"	27
55.5	1	"	"	34
54.3	1	"	"	38
52.9	2n	"	"	44
52.3	4	"	"	51
50.1	2	"	"	54
49.3	1	"	"	65
46.7	1	"	"	69
45.7	1n	"	"	82
44.4	1	"	"	87
43.3	1 Fe	"	"	94
42.4	2 Fe	"	"	500
41.8	1	"	"	04
41.1	1	"	"	07
40.3	1	"	"	11
39.2	1	"	"	15
37.2	2	"	"	20
35.2	4	"	"	30
34.5	1	"	"	41
33.7	4	"	"	44
30.8	1 Fe	1.21	6.3	48
28.5	1	"	"	63
26.9	2	"	"	75
23.9	2	"	"	83
				98



MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4423.2	1n	1.21	6.3	22602
22.4	1n	"	"	06
21.0	1n	"	"	13
15.3	2	"	"	42
13.1	2	"	"	53
12.5	2	"	"	57
11.9	6	"	"	60
10.2	1	"	"	68
09.7	1	"	"	71
07.8	2	"	"	81
07.1	1	"	"	84
06.2	1n	"	"	89
04.8	2n Fe	"	"	96
04.1	1n	"	"	99
03.5	1	"	"	703
03.3	4n	"	"	04
02.8	1	"	"	06
01.4	1	"	"	14
4399.4	1	"	"	24
98.8	1	"	"	27
97.5	2	"	"	34
96.8	2	"	"	37
94.6	2	"	"	49
93.8	1	1.20	"	53
92.2	1	"	"	61
91.8	2	"	"	63
91.1	1	"	"	67
90.0	1	"	"	73
89.7	1	"	"	74
88.5	1	"	"	80
87.8	1	"	"	84
86.1	1	"	"	93
85.8	1	"	"	95
84.9	1	"	"	99
84.4	1	"	"	802
83.8	1 Fe	"	"	05
83.4	1	"	"	07
82.6	1	"	"	11
81.7	4	"	"	16
80.7	1	"	"	21
80.4	2	"	"	23
79.7	1	"	"	26
79.5	1	"	"	27
77.9	6	"	"	36
76.9	2	"	"	41
75.1	2	"	"	50
74.2	1	"	"	55
73.4	1	"	"	59
72.2	1	"	"	65
70.8	1	"	"	73
69.2	2	"	"	81
66.7	1n	"	6.4	94
64.6	1n	"	"	905
63.7	8	"	"	10
62.1	1	"	"	18

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4359.8	1	1.20	6.4	22930
58.3	6	"	"	38
56.1	1	1.19	"	50
55.4	1	"	"	54
53.4	1	"	"	64
51.6	1n	"	"	74
50.4	2	"	"	80
44.9	1	"	"	23009
41.6	2	"	"	27
40.9	1	"	"	30
40.0	1	"	"	35
39.4	1	"	"	38
38.8	1	"	"	41
36.8	1 W?	"	"	52
35.3	2 W?	"	"	60
34.9	1	"	"	62
33.4	1	"	"	70
32.7	1	"	"	74
29.9	1	"	"	89
29.6	1	"	"	90
28.3	1	"	"	97
27.1	2	"	"	104
26.3	4	"	"	08
26.1	1	"	"	09
25.6	1	"	"	12
24.7	1n	"	"	17
23.6	1	"	"	22
18.7	1	1.18	"	49
18.1	2	"	"	52
17.4	1	"	"	56
15.4	1	"	"	66
13.7	1n	"	"	76
13.0	1	"	"	79
12.6	1	"	"	81
11.8	4	"	"	86
11.2	4	"	"	89
10.6	1	"	"	92
08.9	1	"	6.5	201
08.3	1	"	"	04
05.1	1	"	"	22
04.2	1	"	"	27
02.8	1	"	"	34
02.2	1 W	"	"	37
01.5	1	"	"	41
00.9	1n	"	"	44
4299.4	1	"	"	53
99.2	1	"	"	54
98.2	1n	"	"	59
97.7	1n	"	"	62
96.8	1	"	"	67
96.4	1	"	"	69
94.9	2	"	"	77
94.2	2 W	"	"	81
93.4	4	"	"	85
92.4	2	"	"	92

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
4291.9	1	1.18	6.5	23293
91.4	1	"	"	96
90.4	1	"	"	301
89.9	1	"	"	04
89.7	1	"	"	05
88.9	4	"	"	10
87.2	1	"	"	19
85.9	1	"	"	26
84.9	1	"	"	31
82.0	1	"	"	47
80.7	1	1.17	"	54
80.2	1	"	"	57
79.2	6	"	"	62
77.5	6	"	"	72
77.2	6	"	"	73
76.4	1	"	"	78
75.8	1	"	"	81
74.6	2	"	"	87
73.4	1	"	"	94
72.4	1	"	"	99
72.0	1	"	"	402
71.2	1	"	"	06
69.4	2 W	"	"	16
68.2	1	"	"	23
66.8	1	"	"	30
66.4	1	"	"	32
65.2	1	"	"	39
64.8	1	"	"	41
63.6	1n	"	"	48
62.6	1n	"	"	53
61.6	1	"	"	59
61.1	1	"	"	62
60.8	1	"	"	63
60.5	1 Fe	"	"	65
59.5	1n	"	"	70
58.9	1n	"	"	74
58.0	1n	"	"	79
56.9	1	"	"	85
55.2	2	"	"	94
54.6	1	"	"	97
53.6	1n	"	6.6	503
52.6	1n	"	"	08
52.1	2	"	"	11
50.6	6 Fe	"	"	19
46.7	1	"	"	41
46.2	1	"	"	44
44.9	4	"	"	51
43.2	2	1.16	"	60
40.9	1	"	"	73
40.4	1	"	"	76
40.3	1	"	"	77
39.2	1n	"	"	83
38.5	1n	"	"	87
37.4	1n	"	"	93
35.1	1	"	"	606

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
4233.6	1	1.16	6.6	23614
32.7	4	"	"	19
26.9	2 Ca	"	"	51
25.1	1	"	"	61
24.1	1n	"	"	67
23.1	1	"	"	73
22.6	1	"	"	75
21.1	1	"	"	84
19.6	1	"	"	92
19.1	1	"	"	95
16.9	1	"	"	707
14.6	1	"	"	20
14.2	1	"	"	23
12.9	1	"	"	30
11.1	1	"	"	40
09.8	6	"	"	47
07.4	1	"	"	61
05.9	1	1.15	"	69
04.9	1	"	"	75
02.3	1n	"	"	90
01.5	1n	"	"	94
00.7	1	"	"	99
4199.1	1	"	6.7	808
94.5	2	"	"	34
92.3	2	"	"	47
91.1	1	"	"	53
90.1	1	"	"	59
88.3	4	"	"	69
86.4	1	"	"	80
85.9	4	"	"	83
84.4	1	"	"	92
78.5	1	"	"	925
78.2	1	"	"	27
77.3	1	"	"	32
75.5	1n	"	"	42
74.3	1n	"	"	49
72.6	1	"	"	59
72.0	2	"	"	63
71.4	2n	"	"	66
70.0	1	"	"	74
69.2	1	"	"	79
68.7	1	1.14	"	82
66.5	1	"	"	95
65.6	1	"	"	99
64.4	1	"	"	24006
63.0	2	"	"	14
61.5	2	"	"	23
58.2	1n	"	"	42
57.6	2	"	"	46
57.0	1	"	"	49
55.8	1	"	"	56
55.5	2	"	"	58
54.5	1	"	"	64
53.1	1	"	"	72
52.2	1	"	"	77



MOLYBDENUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4151.0	1n	1.14	6.7	24084
49.2	2	"	"	94
47.1	2	"	6.8	106
46.3	2	"	"	11
43.9	6	"	"	25
41.6	2	"	"	38
40.0	2	"	"	48
38.8	1n	"	"	55
38.0	1	"	"	59
37.0	1	"	"	65
35.7	1	"	"	73
33.1	1n	"	"	88
32.4	1	"	"	92
32.2	1	"	"	93
31.1	1n	"	"	200
30.4	1n	1.13	"	04
29.0	1	"	"	12
28.4	1	"	"	16
28.2	1	"	"	17
27.5	1n	"	"	21
26.7	1	"	"	26
26.5	1	"	"	27
25.7	1	"	"	31
24.8	1	"	"	37
23.7	1	"	"	43
22.4	4	"	"	51
20.3	4	"	"	63
19.9	4	"	"	66
19.1	2	"	"	70
18.7	1	"	"	73
16.9	1	"	"	83
16.1	1	"	"	88
15.2	1	"	"	94
14.6	1n	"	"	97
14.2	1n	"	"	99
11.9	1	"	"	313
10.9	1	"	"	19
10.4	1n	"	"	22
08.9	1	"	"	31
07.5	4	"	"	39
05.7	1	"	"	50
03.5	1	"	"	63
03.1	1	"	"	65
02.8	1 W	"	"	67
02.1	2	"	"	71
00.4	1	"	"	81
4098.9	1	"	6.9	90
98.4	2n	"	"	93
97.0	1	"	"	401
95.7	1	"	"	09
94.9	1	"	"	14
94.5	1	"	"	16
92.9	1	1.12	"	26
91.1	1b	"	"	36
88.9	1n	"	"	50

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4087.3	1	1.12	6.9	24459
86.2	1	"	"	66
84.5	4	"	"	76
81.7	4	"	"	93
81.3	1	"	"	95
77.9	1	"	"	515
76.3	1	"	"	25
75.7	1	"	"	29
75.5	1	"	"	30
74.5	2 W	"	"	36
71.9	2	"	"	52
67.9	1	"	"	76
67.2	1n	"	"	80
66.4	1	"	"	85
64.8	1	"	"	95
64.6	1	"	"	96
63.8	1	"	"	601
62.3	4	"	"	10
59.8	1	"	"	25
58.7	1	"	"	31
57.6	2	"	"	38
56.4	1	"	"	45
56.0	2	"	"	48
51.4	1	1.11	7.0	76
50.2	1	"	"	83
49.8	1	"	"	86
47.6	1n	"	"	99
46.9	1	"	"	703
46.8	1	"	"	04
45.8	1 Fe	"	"	10
45.6	1	"	"	11
43.7	1	"	"	23
42.9	1	"	"	28
41.2	1b	"	"	38
38.9	1	"	"	52
38.2	1	"	"	56
37.9	1	"	"	58
36.6	1	"	"	66
35.7	2n	"	"	72
33.6	1	"	"	85
32.5	1n	"	"	92
31.4	1n	"	"	98
30.9	1n	"	"	801
28.7	1n	"	"	15
27.7	1n	"	"	21
27.0	1n	"	"	25
26.0	1n	"	"	32
25.6	1	"	"	34
24.2	1	"	"	43
23.6	1	"	"	46
20.9	1	"	"	63
20.5	1	"	"	66
17.8	1	"	"	82
17.3	1	"	"	85
16.1	1n	"	"	93

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4015.2	1	1.10	7.0	24898
14.4	1	"	"	903
13.2	2	"	"	11
11.9	1n	"	"	19
10.3	1	"	"	29
09.4	1	"	"	34
08.7	2 (W)	"	"	39
08.0	1	"	"	43
06.8	1	"	"	51
06.5	1	"	"	52
06.0	1	"	"	56
05.0	1 (Fe)	"	"	62
02.9	1	"	7.1	75
00.5	1	"	"	90
00.0	1	"	"	93
3998.6	1	"	"	25002
98.4	1	"	"	03
94.0	1	"	"	31
93.1	1	"	"	36
91.8	1	"	"	44
91.4	1	"	"	47
90.9	2	"	"	50
89.9	1	"	"	56
89.5	1n	"	"	59
86.1	4	"	"	80
82.6	1n	"	"	102
82.1	1n	"	"	05
81.6	1	"	"	08
80.8	1	"	"	14
80.4	1	"	"	16
79.4	1	"	"	22
77.9	1	"	"	32
76.4	1	"	"	41
74.8	1	1.09	"	51
73.8	4	"	"	58
73.4	4	"	"	60
73.0	1n	"	"	63
71.5	1n	"	"	72
71.1	1n	"	"	75
68.6	8 Ca	"	"	91
67.9	1	"	"	95
66.3	1	"	"	205
65.8	1	"	"	09
64.1	1	"	"	19
63.6	1	"	"	22
62.9	2	"	"	27
61.4	10	"	"	36
60.1	1n	"	"	45
58.5	1	"	"	55
55.6	1	"	7.2	73
54.0	1	"	"	84
52.9	2	"	"	91
51.0	1	"	"	303
48.7	1	"	"	18
47.4	1	"	"	26

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
3947.1	1	1.09	7.2	25328
47.0	1	"	"	29
45.3	1	"	"	39
45.1	1	"	"	41
44.1	2	"	"	47
43.6	1	"	"	50
43.1	2	"	"	54
42.9	4	"	"	55
41.5	6	"	"	64
38.7	1	"	"	82
37.6	1n	"	"	89
36.8	1	1.08	"	94
35.1	1	"	"	405
35.0	2	"	"	06
33.7	8 (W)	"	"	14
31.4	1	"	"	29
30.9	1	"	"	32
30.4	1	"	"	36
29.7	1	"	"	40
28.8	1	"	"	46
27.7	1	"	"	53
27.1	1	"	"	57
26.4	1n	"	"	61
{ 25.9	2	"	"	65
25.8	1	"	"	65
23.7	1	"	"	79
22.3	1	"	"	88
21.6	1	"	"	93
21.0	1	"	"	96
20.3	1n	"	"	501
17.9	1	"	"	17
17.6	1	"	"	19
17.1	1	"	"	22
16.5	1	"	"	26
15.4	4	"	"	33
13.7	1	"	"	44
11.1	1	"	"	61
10.1	1	"	"	68
09.5	1	"	"	72
08.6	2	"	7.3	77
06.8	1	"	"	89
06.4	1	"	"	92
05.5	1	"	"	98
04.9	2n	"	"	601
03.0	1	"	"	14
01.9	2	"	"	21
3897.9	1	"	"	47
96.9	1	1.07	"	54
96.5	1	"	"	57
94.1	1	"	"	73
94.0	1	"	"	73
93.5	1	"	"	77
92.4 }	1	"	"	84
92.0 }	1	"	"	86
91.4	1	"	"	90



MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3891.2	1	1.07	7.3	25692
90.7	1	"	"	95
90.6	1	"	"	96
89.0	1	"	"	706
88.4	1n	"	"	10
88.1	1	"	"	12
87.8	1	"	"	14
87.1	1	"	"	19
85.7	1n	"	"	28
83.5	1	"	"	43
83.4	1	"	"	43
83.0	1	"	"	46
82.4	2	"	"	50
81.5	1	"	"	56
80.1	1	"	"	65
79.8	1	"	"	67
79.1	1	"	"	72
78.7	1	"	"	74
76.9	1	"	"	86
75.4	1	"	"	96
73.4	1	"	"	810
72.1	1	"	"	18
71.6	2	"	"	22
69.2	2	"	"	38
68.0	1	"	"	46
67.8	1	"	"	47
66.9	1	"	"	53
65.7	1	"	"	61
64.2	10	"	"	71
62.7	1	"	"	81
61.5	2	"	"	89
60.0	1	"	"	99
58.9	1	"	"	907
58.4	1	"	"	10
56.7	1n	1.06	"	22
56.1	1n	"	"	26
55.0	1	"	"	33
54.8	1	"	"	34
53.6	1	"	"	42
53.4	1	"	"	44
52.8	1	"	"	48
52.2	1	"	"	52
51.6	1	"	"	56
50.9	1	"	"	61
49.9	1	"	"	67
48.5	2	"	"	77
47.4	2	"	"	84
46.3	1	"	"	92
46.1	1	"	"	93
44.2	1	"	"	26006
43.2	1	"	"	13
42.8	1	"	"	15
42.1	1n	"	"	20
40.6	1	"	"	30
40.0	1n	"	"	34

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3839.7	1	1.06	7.3	26036
39.1	1	"	"	40
38.8	1	"	"	42
37.4	1	"	"	52
35.4	4	"	"	66
35.1	1	"	"	68
34.7	1	"	"	70
34.3	1	"	"	73
33.9	1	"	"	76
33.7	2	"	"	77
32.5	6	"	"	85
32.3	2	"	"	87
32.1	2	"	"	88
31.1	1	"	"	95
31.0	1	"	"	96
30.1	1	"	"	102
30.0	1	"	"	02
28.9	1	"	"	10
28.5	2	"	"	13
28.4	1	"	"	13
28.0	1	"	"	16
27.3	1	"	"	21
26.8	1	"	"	24
26.0	2	"	"	30
25.5	1	"	"	33
25.0	1	"	"	37
24.6	1	"	"	39
23.7	1	"	"	45
23.1	1	"	"	49
23.0	1	"	"	50
22.5	1	"	"	54
22.0	1	"	"	57
21.8	1	"	"	58
19.3	1	"	"	75
19.2	1	"	"	76
18.7	1	"	"	80
18.4	1	"	"	82
18.1	1	"	7.4	84
17.5	1	"	"	88
17.2	1	"	"	90
16.7	1	1.05	"	93
15.9	1	"	"	99
15.3	1	"	"	203
15.2	1	"	"	04
14.6	1	"	"	08
14.0	1	"	"	12
12.5	1	"	"	22
12.3	2	"	"	23
12.0	1	"	"	26
11.5	1	"	"	29
11.0	1	"	"	32
10.2	1	"	"	38
09.9	1	"	"	40
09.3	1	"	"	44
08.8	1	"	"	48

MOLYBDENUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3807.8	1n	1.05	7.4	26255
07.1	1	"	"	59
06.9	1	"	"	61
06.1	1	"	"	66
05.5	1n	"	"	70
04.6	1	"	"	77
03.5	1	"	"	84
02.5	1	"	"	91
02.2	1	"	"	93
01.8	2	"	"	96
01.1	1	"	"	301
00.4	1n	"	"	06
3798.3	10	"	"	20
97.4	1	"	"	26
97.2	1	"	"	28
96.7	2	"	"	29
96.2	1	"	"	35
95.7	1	"	"	38
95.4	1	"	"	40
95.1	1	"	"	42
94.5	1	"	"	47
93.8	1	"	"	51
92.3	1	"	"	62
92.1	1	"	"	63
91.8	1	"	"	65
91.5	1	"	"	67
90.5	1n	"	"	74
88.4	2	"	"	89
88.0	1	"	"	92
87.4	1	"	"	96
86.6	4	"	"	402
85.7	1	"	"	08
85.3	1	"	"	11
83.3	4	"	"	25
82.2	4	"	"	32
81.8	2	"	"	35
81.4	1	"	"	38
81.1	1	"	"	40
81.0	1	"	"	41
79.8	2	"	"	49
78.1	1	"	"	61
77.8	1	"	"	63
77.0	1	1.04	"	69
76.8	1	"	"	70
76.3	1	"	"	74
75.8	1	"	"	77
74.8	1	"	"	84
73.9	1	"	"	90
73.1	1	"	7.5	96
72.2	2	"	"	502
71.7	1	"	"	06
70.7	2	"	"	13
70.2	1	"	"	16
69.3	1	"	"	23
68.8	1	"	"	26

MOLYBDENUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3768.0	2	1.04	7.5	26532
67.4	1	"	"	36
66.5	1	"	"	42
65.9	1	"	"	47
65.5	1	"	"	49
65.3	1	"	"	51
64.7	1	"	"	55
64.2	1	"	"	59
64.1	1	"	"	59
63.1	1	"	"	66
62.4	2	"	"	71
62.1	2	"	"	73
61.4	1	"	"	78
61.0	1	"	"	81
60.9	1	"	"	82
60.3	1	"	"	86
59.5*	1	"	"	92
58.7	2	"	"	97
58.3	2	"	"	600
57.0	1	"	"	09
56.5	1	"	"	13
55.6	4	"	"	19
55.4	1	"	"	23
54.9	2	"	"	24
54.0	1	"	"	31
53.9	1	"	"	32
53.5	2	"	"	34
52.3	1	"	"	43
51.7	1	"	"	47
51.1	2	"	"	51
50.4	1	"	"	56
48.6	2	"	"	69
48.2	2	"	"	72
47.6	1	"	"	76
47.3	1	"	"	78
47.2	1	"	"	79
46.5	2	"	"	84
46.0	1	"	"	88
45.6	1	"	"	90
45.5	1	"	"	91
45.0	1	"	"	95
44.5	4	"	"	98
43.9	1	"	"	703
43.5	1	"	"	06
43.1	1	"	"	08
42.4	6	"	"	13
41.9	1	"	"	17
39.0	1	"	"	38
37.9	1	1.03	"	45
37.2	2	"	"	50
36.5	2	"	"	56
36.3	2	"	"	57
36.1	1	"	"	58

\*Double.



## MOLYBDENUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3735.8	1	1.03	7.5	26761
34.8	1	"	"	68
34.4	1	"	"	71
34.0	1	"	"	73
33.5	1	"	"	77
33.1	1	"	"	80
32.8	2	"	"	82
30.6	1	"	"	98
30.1	1	"	"	801
29.1	1	"	"	09
28.5	1	"	"	13
28.4	1	"	7 6	14
27.8	2	"	"	18
26.6	1	"	"	27
25.7	2	"	"	33
25.1	1	"	"	37
24.5	1	"	"	42
23.9	1	"	"	46
23.6	1	"	"	48
23.1	1	"	"	52
22.6	1	"	"	55
22.4	1	"	"	57
22.1	1	"	"	59
20.4	2	"	"	71
19.9	2	"	"	75
19.7	1	"	"	76
19.1	2	"	"	81
18.5	1	"	"	85
17.0	4	"	"	96
16.1	2	"	"	902
15.7	2	"	"	05
15.3	1	"	"	08
14.6	1	"	"	13
14.0	2	"	"	18
13.5	1	"	"	21
13.1	1n	"	"	24
12.0	1	"	"	32
11.8	1	"	"	33
11.6	1	"	"	35
10.6	1	"	"	42
10.3	1	"	"	44
09.6	1	"	"	49
08.6	1	"	"	57
08.0	1	"	"	61
07.7	2	"	"	63
07.2	c	"	"	67
06.1	1n	"	"	75
05.6	1	"	"	79
05.5	1	"	"	79
04.2	2	"	"	89
02.5	8	"	"	27001
02.1	1	"	"	04
01.4	1	"	"	09
01.1	1	"	"	11
00.0	2n	"	"	19

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3698.7	1	1.03	7.6	27029
97.8	1	1.02		35
97.5	1	"	"	38
97.1	1	"	"	41
96.0	1	"	"	49
95.1	2	"	"	55
94.6	1	"	"	59
93.8	2	"	"	65
92.7	6	"	"	73
92.2	1	"	"	76
91.7	1	"	"	80
90.7	1	"	"	87
90.5	2	"	"	89
90.0	1	"	"	93
89.0	1	"	"	100
88.3	10	"	"	05
87.6	2	"	"	10
87.1	1	"	"	14
86.7	1	"	"	17
86.1	1	"	"	21
85.8	1	"	"	24
85.2	1	"	"	28
84.3	4	"	"	35
83.1	1	"	7.7	43
82.7	1	"	"	46
81.6	1	"	"	54
80.6	4	"	"	62
80.4	1	"	"	63
80.1	1	"	"	65
79.4	1	"	"	71
79.2	1	"	"	72
78.8	1	"	"	75
78.1	1	"	"	80
77.9	1	"	"	82
76.4	1	"	"	93
75.5	1	"	"	99
73.9	1n	"	"	211
72.1	1n	"	"	25
71.9	2	"	"	26
70.9	1	"	"	34
70.7	1	"	"	35
70.6	4	"	"	36
70.0	1	"	"	40
†69.5	2	"	"	44
68.5	1	"	"	51
68.4	1	"	"	52
68.1	1	"	"	54
67.8	1	"	"	57
67.5	1	"	"	59
67.0	1	"	"	63
66.7	1	"	"	65
65.8	1n	"	"	71
65.0	2	"	"	77

† Coincident with an iron line of the comparison spectrum.

MOLYBDENUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3664.5	1	1.02	7.7	27281
64.1	1	"	"	84
63.8	1	"	"	86
63.4	1	"	"	89
63.0	1	"	"	92
62.3	1	"	"	98
61.8	1	"	"	301
61.1	1	"	"	06
59.6	2	"	"	18
59.0	4	"	"	22
58.4	4	"	"	27
57.5	5 (W)	1.01	"	33
56.2	1	"	"	43
55.9	1	"	"	45
55.1	1	"	"	51
54.6	1	"	"	55
54.4	1	"	"	57
53.9	1	"	"	60
53.7	1	"	"	62
52.5	6	"	"	71
51.3	6	"	"	80
50.2	2	"	"	88
49.6	1	"	"	93
48.6	1	"	"	400
48.0	1	"	"	05
†47.6	1	"	"	08
47.1	1	"	"	11
47.0	1	"	"	12
46.3	1 <sub>n</sub> (W)	"	"	17
45.9	1	"	"	20
43.7	2	"	"	37
43.1	1	"	"	41
42.9	1	"	"	43
41.6	1	"	"	53
41.2	1	"	"	56
40.8	1	"	"	59
40.5	1	"	"	61
39.9	2	"	"	66
38.5	1	"	7.8	76
38.3	1	"	"	78
37.9	1	"	"	81
37.7	1	"	"	82
36.8	1	"	"	89
35.4	2	"	"	99
35.2	1	"	"	501
34.5	1	"	"	06
33.5	2	"	"	14
31.6	1	"	"	28
†31.3	1	"	"	31
29.5	1	"	"	44
28.8	1	"	"	50
28.6	1	"	"	51
27.5	2	"	"	59

† Coincident with an iron line of the comparison spectrum.

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3626.4	2	1.01	7.8	27568
25.8	2	"	"	72
24.7	2	"	"	81
23.9	2	"	"	87
23.4	2	"	"	91
23.1	2	"	"	93
22.6	1n	"	"	97
20.4	1n	"	"	613
19.6	1n	"	"	20
19.0	1	"	"	24
18.6	1	"	"	27
17.7	2	1.00	"	34
17.0	1	"	"	39
16.9	1	"	"	40
16.2	1	"	"	46
15.9	1	"	"	48
15.3	1	"	"	52
14.9	2	"	"	55
14.4	4	"	"	59
13.8	1	"	"	64
13.6	1 (W)	"	"	65
12.4	1	"	"	75
12.1	4	"	"	77
11.2	1	"	"	84
10.7	1	"	"	88
09.7	1	"	"	95
09.4	1	"	"	98
09.1	1	"	"	700
08.8	1	"	"	02
08.5	1	"	"	05
07.0	2	"	"	16
06.9	2	"	"	17
05.5	1	"	"	28
05.2	1	"	"	30
04.8	1	"	"	33
04.1	1	"	"	38
03.8	1	"	"	41
03.7	1	"	"	41
03.3	1	"	"	45
03.1	2	"	"	46
02.5	1n	"	"	51
02.0	1	"	"	55
01.8	1	"	"	56
01.5	1	"	"	58
01.0	1n	"	"	62
00.4	1	"	"	67
00.0	1	"	"	70
3599.0	2	"	"	78
97.7	1	"	"	88
96.4	4	"	"	98
95.6	1	"	"	804
95.4	1	"	"	06
94.0	1	"	7.9	16
93.2	1	"	"	22
92.6	1	"	"	27



MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3592.3	1 (W)	1.00	7.9	27829
92.0	1	"	"	32
91.7	2	"	"	34
91.6	1	"	"	35
90.8	2	"	"	41
90.1	2	"	"	46
89.4	2	"	"	52
89.0	1	"	"	55
88.1	1	"	"	62
86.8	1	"	"	72
85.9	2	"	"	79
85.6	4	"	"	81
84.2	1	"	"	92
83.1	1	"	"	901
82.7	1	"	"	04
82.5	1	"	"	06
81.9	1	"	"	10
81.3	1	"	"	15
80.7	1	"	"	20
80.3	1	"	"	23
79.0	1	"	"	33
77.5	1	0.99	"	45
77.0	1	"	"	48
76.2	1	"	"	55
75.7	1	"	"	59
74.5	1	"	"	68
74.1	1	"	"	71
73.8	1	"	"	74
72.5	1 (W)	"	"	84
71.3	1	"	"	93
70.7	2	"	"	98
70.1	1	"	"	28003
69.6	1	"	"	06
68.7	1	"	"	14
68.1	1n	"	"	18
67.1	1	"	"	26
66.8	1	"	"	28
66.3	1	"	"	32
66.0	1	"	"	35
65.4	1	"	"	39
64.5	1	"	"	47
64.3	1	"	"	48
63.9	1	"	"	51
63.2	2	"	"	57
62.1	1	"	"	65
61.9	1	"	"	67
61.3	2	"	"	72
60.0	1	"	"	82
59.7	1	"	"	84
59.2	1	"	"	88
58.8	1	"	"	91
58.6	1	"	"	93
58.1	2	"	"	97
57.0	2	"	"	106
56.3	2	"	"	11

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3555.5	1	0.99	7.9	28118
54.2	1	"	"	28
53.8	1	"	"	31
53.2	1	"	"	36
52.7	1	"	"	40
52.5	1	"	"	41
52.1	1	"	"	44
51.5	ln	"	8.0	49
51.0	1	"	"	53
49.1	1	"	"	68
48.8	1	"	"	71
48.0	2	"	"	77
47.5	1	"	"	81
47.1	1	"	"	84
45.9	4	"	"	94
43.8	ln	"	"	210
43.3	1	"	"	14
42.4	2	"	"	21
42.1	4	"	"	24
41.1	ln	"	"	32
40.8	ln	"	"	37
40.4	ln	"	"	40
39.6	ln	"	"	44
38.9	ln	"	"	49
37.1	4	0.98	"	64
36.5	1	"	"	69
35.2	1	"	"	79
34.7	2	"	"	83
33.1	2	"	"	96
32.5	ln	"	"	301
31.5	1	"	"	09
31.3	1	"	"	10
30.9	1	"	"	13
29.8	1	"	"	22
29.5	2	"	"	25
28.8	1	"	"	30
28.0	2	"	"	37
26.6	1	"	"	48
26.4	1	"	"	50
26.0	1	"	"	53
24.9	1	"	"	62
24.6	6	"	"	64
24.0	1	"	"	69
22.5	1	"	"	81
22.2	2	"	"	83
21.6	2	"	"	88
20.2	2	"	"	99
19.8	1	"	"	403
18.6	1	"	"	12
18.3	1	"	"	15
17.5	1	"	"	21
16.7	1	"	"	28
15.8	2	"	"	35
15.1	2	"	"	41
14.9	1	"	"	42

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda -$	$\frac{1}{\lambda} -$	
3513.8	1	0.98	8.0	28451
13.1	1	"	"	57
11.8	1n	"	"	67
10.8	1	"	"	76
10.2	1	"	8.1	80
10.0	1	"	"	82
09.3	1	"	"	88
08.5	1	"	"	94
08.1	2	"	"	97
07.3	1	"	"	504
06.6	1	"	"	10
05.4	2	"	"	19
04.5	2	"	"	27
02.7	1	"	"	39
01.9	4	"	"	48
01.0	1	"	"	55
00.0	2	"	"	63
3499.0	2	0.97	"	71
98.4	1	"	"	76
98.1	1	"	"	79
97.1	1	"	"	87
96.8	1	"	"	89
95.1	1n	"	"	603
94.3	1	"	"	10
93.4	1	"	"	17
92.0	1	"	"	29
91.3	1n	"	"	35
90.6	1	"	"	40
90.4	1	"	"	42
89.5	1	"	"	49
88.7	1	"	"	56
88.2	2	"	"	60
87.9	2	"	"	62
85.9	1	"	"	79
85.8	2	"	"	80
84.4	2	"	"	91
83.9	1	"	"	95
83.8	1	"	"	96
82.8	1	"	"	704
82.5	1n	"	"	07
81.8	1	"	"	13
81.1	1n	"	"	18
80.2	1	"	"	26
79.5	1n	"	"	32
77.6	1n	"	"	47
75.6	1	"	"	64
75.1	2	"	"	68
74.8	1n	"	"	71
74.1	1n	"	"	76
73.3	1n	"	"	83
71.7	1	"	"	96
71.0	2	"	8.2	802
70.8	1n	"	"	04
69.7	1	"	"	13
69.3	2	"	"	16

MOLYBDENUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda -}$	
3468.5	1	0.97	8.2	28823
68.3	1	"	"	24
68.0	2	"	"	27
67.0	1	"	"	35
66.8	1	"	"	37
66.3	1	"	"	41
65.9	1	"	"	44
65.8	1	"	"	45
65.0	1n	"	"	52
64.5	1n	"	"	56
63.9	1	"	"	61
63.7	1	"	"	63
63.3	2	"	"	66
62.2	2	"	"	75
60.9	2	"	"	86
60.3	1	"	"	91
60.1	1	"	"	93
58.9	1	0.96	"	903
58.2	1	"	"	09
57.7	1	"	"	13
57.5	1	"	"	14
56.5	2	"	"	23
56.3	2	"	"	24
55.9	1	"	"	28
55.5	1	"	"	31
55.2	1	"	"	34
54.3	1	"	"	41
53.5	1	"	"	48
53.0	2	"	"	52
52.8	2	"	"	54
51.8	1	"	"	62
50.9	1	"	"	70
50.6	1	"	"	72
50.0	1	"	"	77
49.1	2	"	"	85
48.6	2	"	"	89
48.1	1	"	"	93
47.1	2	"	"	29002
46.1	4	"	"	10
45.5	2	"	"	15
45.4	1	"	"	16
45.2	1	"	"	18
44.4	1n	"	"	24
44.0	1n	"	"	28
43.3	1	"	"	34
42.7	1	"	"	39
42.6	1	"	"	40
42.0	1	"	"	45
41.5	2	"	"	49
41.1	1n	"	"	52
40.7	1	"	"	56
40.6	1	"	"	57
40.2	1n	"	"	60
39.9	1	"	"	62
39.6	1	"	"	65



MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3439.1	1n	0.96	8.2	29069
38.9	2	"	"	71
38.0	1n	"	"	78
36.7	1	"	"	89
35.5	4	"	"	100
34.8	2	"	"	06
34.6	1	"	"	07
34.1	1	"	"	12
33.4	1	"	"	17
33.1	1n	"	8.3	20
32.2	2	"	"	28
30.7	1	"	"	40
30.4	1n	"	"	43
29.6	1	"	"	50
28.9	1	"	"	56
28.1	1	"	"	62
28.0	1	"	"	63
27.6	1	"	"	67
27.1	2	"	"	71
26.9	1	"	"	73
26.0	1	"	"	80
25.6	1	"	"	84
25.3	1	"	"	86
24.9	1	"	"	90
24.8	1	"	"	90
24.3	1	"	"	95
†22.8	4	"	"	208
22.3	2	"	"	12
21.3	2	"	"	20
20.1	2	"	"	31
19.0	2	"	"	40
18.5	2	"	"	44
18.4	1	"	"	45
18.1	1	"	"	48
17.6	1	0.95	"	52
17.1	1	"	"	56
16.7	1	"	"	60
16.1	1	"	"	65
15.7	1	"	"	68
15.4	1	"	"	71
14.5	1	"	"	79
13.8	1	"	"	85
13.5	1	"	"	87
12.4	1	"	"	97
12.1	1	"	"	99
10.6	1	"	"	312
08.7	2	"	"	28
07.6	2	"	"	38
07.3	2	"	"	40
†06.0	2	"	"	52
05.8	2	"	"	53
05.2	1	"	"	59
04.3	2	"	"	66
02.8	2	"	"	79
01.6	1	"	"	90

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
3400.3	1	0.95	8.3	29401
3399.2	1	"	"	10
98.3	2	"	"	18
97.9	1	"	"	22
97.0	1	"	"	29
96.8	1	"	"	31
95.5	2	"	8.4	42
95.0	1	"	"	47
93.8	1	"	"	57
93.3	1	"	"	61
93.1	1	"	"	63
92.0	4	"	"	73
90.3	1	"	"	88
89.8	1	"	"	92
88.9	1n	"	"	500
88.0	1	"	"	08
87.3	1	"	"	14
87.2	1	"	"	15
86.4	1	"	"	21
86.0	1	"	"	25
84.7	2	"	"	36
84.0	2	"	"	42
82.7	2	"	"	54
82.6	1	"	"	55
82.0	1	"	"	60
80.5	4	"	"	73
79.9	4	"	"	78
78.7	1	"	"	89
78.4	1	"	"	91
76.8	1	0.94	"	605
75.7	1	"	"	15
75.3	1	"	"	19
75.0	1	"	"	21
74.8	1	"	"	23
73.1	1	"	"	38
72.8	1	"	"	41
71.8	2	"	"	49
70.7	1	"	"	59
70.1	1	"	"	64
69.8	1	"	"	67
69.5	1	"	"	70
68.0	4	"	"	83
66.3	1	"	"	98
65.5	1	"	"	705
65.2	1	"	"	08
63.9	2	"	"	19
63.8	1	"	"	20
63.0	2	"	"	27
62.6	1	"	"	30
61.3	1	"	"	42
60.3	2	"	8.5	51
58.5	1	"	"	67
58.3	2	"	"	68
58.1	1	"	"	70
57.1	1	"	"	79

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in <i>V</i> acuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3355.6	1	0.94	8.5	29792
55.1	1	"	"	97
53.8	1	"	"	808
52.9	1	"	"	16
51.9	1	"	"	25
51.0	1	"	"	33
50.7	1	"	"	36
50.3	1	"	"	40
49.5	1	"	"	47
49.1	2	"	"	50
48.0	1n	"	"	60
47.3	2	"	"	66
47.1	1	"	"	68
46.4	4	"	"	74
46.1	2	"	"	77
44.8	1	"	"	89
42.6	2 (W)	"	"	908
41.9	2	"	"	15
41.7	1	"	"	16
41.3	1	"	"	20
40.6	1	"	"	26
40.2	1	"	"	30
38.3	1n	0.93	"	47
37.1	1n	"	"	58
36.5	1	"	"	63
36.1	1	"	"	67
35.5	1	"	"	72
35.1	2	"	"	76
33.9	1	"	"	86
32.5	2	"	"	99
30.9	1	"	"	30013
30.8	2	"	"	14
30.3	2	"	"	19
†29.3	4	"	"	28
28.6	1	"	"	34
28.1	1	"	"	39
27.3	2	"	"	46
25.7	2	"	"	60
25.3	1	"	"	64
24.8	1	"	8.6	68
24.0	1	"	"	76
22.1	2	"	"	93
20.9	6	"	"	104
19.6	1n	"	"	16
18.2	1	"	"	28
17.5	1	"	"	35
17.1	1	"	"	38
16.8	1	"	"	41
16.3	1	"	"	45
14.5	1	"	"	62
13.6	4	"	"	70
12.9	4	"	"	76
10.8	1	"	"	96
10.1	1	"	"	202
09.4	1	"	"	08

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda -}$	
3309.0	1	0.93	8.6	30212
3083	1	"	"	18
07.0	2	"	"	30
05.8	1	"	"	41
05.5	2	"	"	44
05.2	1	"	"	47
04.5	1	"	"	53
04.3	1	"	"	55
04.0	1	"	"	58
03.5	1	"	"	62
02.6	1	"	"	71
02.4	1n	"	"	72
01.0	1n	"	"	85
00.4	1	"	"	91
3299.5	1	0.92	"	99
98.8	1	"	"	305
97.5	2	"	"	17
96.4	2	"	"	28
96.2	4	"	"	29
95.7	1	"	"	34
95.4	1n	"	"	37
94.9	1	"	"	41
93.7	1	"	"	52
93.6	1	"	"	53
92.4	3b	"	"	64
90.8	4	"	"	79
90.0	1	"	"	87
89.2	2	"	"	94
88.0	2	"	8.7	405
87.4	2	"	"	10
86.7	1	"	"	17
86.4	1	"	"	20
85.6	1	"	"	27
85.5	1	"	"	28
85.2	1	"	"	31
84.6	2	"	"	36
83.6	1	"	"	46
83.1	4	"	"	50
81.7	1	"	"	63
81.2	2	"	"	68
80.3	1	"	"	76
79.9	1	"	"	80
79.3	1	"	"	86
79.0	4	"	"	88
78.2	2	"	"	96
77.2	1n	"	"	105
76.3	4	"	"	14
74.8	1	"	"	28
74.3	1n	"	"	32
73.7	1	"	"	38
72.4	1	"	"	50
71.6	4	"	"	57
71.1	2	"	"	62
70.3	1n	"	"	70
69.2	2	"	"	80



MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3267.7	2	0.92	8.7	30594
66.9	2	"	"	601
66.3	1n	"	"	07
65.2	2	"	"	17
64.7	1n	"	"	22
64.5	1	"	"	24
64.1	1	"	"	28
63.3	1n	"	"	35
62.7	1	"	"	41
62.5	1	"	"	43
62.2	2	"	"	45
60.6	1	"	"	61
59.8	1n	0.91	"	68
59.1	1	"	"	75
59.0	1	"	"	76
58.7	2	"	"	78
58.3	1	"	"	82
57.4	1	"	"	91
56.2	1	"	"	702
55.2	2	"	"	11
54.7	2	"	"	16
53.8	4	"	"	25
52.8	1	"	8.8	34
52.2	1	"	"	40
51.7	1	"	"	44
51.4	1	"	"	47
50.7	2	"	"	54
50.1	2n	"	"	59
49.3	1	"	"	67
48.2	1	"	"	77
47.7	2	"	"	82
47.4	1	"	"	85
46.3	1	"	"	96
46.0	1	"	"	98
45.9	1	"	"	99
45.4	1	"	"	804
44.7	1	"	"	11
43.2	1	"	"	25
42.5	1	"	"	32
42.1	1	"	"	35
41.5	1	"	"	41
40.8	4	"	"	48
38.4	1	"	"	71
38.0	1	"	"	74
37.1	1	"	"	83
37.0	1	"	"	84
36.3	1n	"	"	91
35.4	2	"	"	99
35.0	2	"	"	903
34.6	1	"	"	07
34.3	1	"	"	10
33.8	2	"	"	15
33.3	1	"	"	19
32.7	1n	"	"	25
30.0	2	"	"	41

## MOLYBDENUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
3230.6	1	0.91	8.8	30945
30.1	1	"	"	50
29.6	4	"	"	55
28.8	1	"	"	62
28.4	1	"	"	66
27.5	1	"	"	75
27.3	1	"	"	77
26.6	1	"	"	84
25.8	1	"	"	91
25.3	1	"	"	96
24.7	2	"	"	31002
23.9	1	"	"	10
23.6	1	"	"	12
22.9	1	"	"	19
22.4	1	"	"	24
21.8	1	"	"	30
21.4	1	"	"	34
21.0	1	0.90	"	37
20.7	1	"	"	40
20.2	1	"	"	45
19.4	1	"	"	53
19.0	1	"	"	57
18.5	2n	"	"	62
16.9	1	"	"	77
16.0	2	"	8.9	86
15.2	2	"	"	93
14.3	2	"	"	102
13.2	2	"	"	13
12.6	1	"	"	19
12.0	2	"	"	24
11.7	1n	"	"	27
11.0	2	"	"	34
10.5	2n	"	"	39
09.8	2	"	"	46
09.0	2	"	"	53
07.4	1n	"	"	69
07.2	1	"	"	71
06.8	1	"	"	75
06.3	1	"	"	80
05.9	1	"	"	84
05.6	1	"	"	87
05.3	1	"	"	89
04.9	2	"	"	93
03.8	1	"	"	204
03.4	1	"	"	08
02.8	1	"	"	14
02.1	1n	"	"	21
01.6	2	"	"	25
+00.3	2	"	"	38
3199.4	1	"	"	47
98.9	1	"	"	52
98.5	2	"	"	56
97.5	1	"	"	66
97.2	1	"	"	68
96.5	1	"	"	75

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3195.9	2	0.90	8.9	31281
95.2	2	"	"	88
94.9	1	"	"	91
94.1	2	"	"	99
93.1	1	"	"	309
92.8	1	"	"	12
92.1	2	"	"	18
91.5	1	"	"	23
90.8	2n	"	"	31
89.4	1	"	"	45
88.1	1	"	"	58
87.6	2	"	"	63
86.4	1	"	"	74
85.6	1	"	"	82
85.5	2	"	"	83
85.1	2	"	"	86
84.6	1	"	"	92
84.0	1	"	"	98
83.3	4	"	"	405
82.9	4	"	"	09
82.5	1	"	"	13
82.0	1	0.89	"	18
81.3	1	"	"	25
80.9	2	"	9.0	29
79.9	1	"	"	39
79.4	1	"	"	43
79.0	1	"	"	47
78.6	1	"	"	51
78.0	1	"	"	57
77.2	1	"	"	65
76.7	1	"	"	70
76.3	4	"	"	74
75.7	1	"	"	80
75.2	4	"	"	85
74.3	2	"	"	94
73.7	2	"	"	500
72.8	4	"	"	09
72.3	2	"	"	14
72.0	2	"	"	17
71.4	1	"	"	23
70.3	2n	"	"	34
69.9	2	"	"	38
69.7	1n	"	"	40
68.7	1	"	"	50
68.4	1	"	"	53
67.9	1	"	"	58
†67.8	1	"	"	59
67.1	1	"	"	66
66.2	1n	"	"	75
65.6	1	"	"	81
64.6	1	"	"	91
64.0	2	"	"	97
63.7	1	"	"	600
63.4	1	"	"	03
62.7	2	"	"	10

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3161·8	1	0·89	9·0	31619
61·4	1	"	"	23
60·2	1	"	"	35
59·2	2	"	"	45
58·9	2	"	"	48
58·2	2	"	"	55
57·3	2	"	"	64
56·9	2	"	"	68
55·7	4	"	"	80
55·2	1	"	"	85
54·7	1	"	"	90
54·0	1	"	"	97
52·8	4	"	"	709
52·3	1	"	"	14
51·7	2	"	"	20
50·6	1	"	"	31
50·3	1	"	"	34
49·0	1	"	"	47
48·5	1n	"	"	52
48·0	2	"	"	57
47·4	2	"	"	63
46·1	1	"	9·1	76
45·7	2	"	"	80
45·3	1	"	"	84
44·7	1	"	"	90
44·5	1	"	"	92
44·1	1	"	"	97
43·2	2	"	"	806
41·8	4	0·88	"	20
41·3	4	"	"	25
40·8	1	"	"	30
40·3	1	"	"	35
39·9	1	"	"	39
39·3	1	"	"	45
38·7	4	"	"	51
38·4	2	"	"	54
37·3	1	"	"	65
37·1	1	"	"	67
36·5	4	"	"	74
35·9	1	"	"	80
35·7	1	"	"	82
34·8	1	"	"	91
34·4	2	"	"	95
33·8	1	"	"	901
32·6	4	"	"	13
31·3	1	"	"	27
30·5	1	"	"	35
30·2	2	"	"	38
28·6	2	"	"	54
27·9	1	"	"	61
26·8	2	"	"	72
26·4	1n	"	"	77
26·0	2	"	"	81
25·7	2	"	"	84
24·9	1	"	"	92



MOLYBDENUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3124.1	1	0.88	9.1	32000
24.0	2	"	"	01
23.3	2	"	"	08
21.9	6	"	"	23
21.2	2	"	"	30
20.4	1	"	"	38
19.9	1	"	"	43
19.4	2	"	"	48
18.8	1	"	"	55
18.3	1n	"	"	60
17.6	1	"	"	67
17.4	1	"	"	69
16.1	2	"	"	82
15.1	1	"	"	93
14.2	1	"	"	103
13.5	2	"	9.2	09
12.9	1n	"	"	15
12.1	1	"	"	23
11.7	2	"	"	28
11.1	1	"	"	34
10.7	4	"	"	38
08.9	2	"	"	57
07.4	1n	"	"	72
06.9	2	"	"	77
06.6	1	"	"	80
06.3	2	"	"	83
05.7	1	"	"	90
05.4	1	"	"	93
04.7	1	"	"	200
04.3	1	"	"	04
03.4	2	"	"	14
01.3	2	0.87	"	35
01.1	2	"	"	37
01.0	1	"	"	38
00.6	2	"	"	43
00.1	2	"	"	48
3099.4	1	"	"	55
98.6	2	"	"	63
98.2	1	"	"	68
97.8	1	"	"	72
97.3	1	"	"	77
97.0	1	"	"	80
96.6	2	"	"	84
95.8	1	"	"	93
95.3	1	"	"	98
95.0	1	"	"	301
94.7	1	"	"	04
94.3	1	"	"	08
93.8	1	"	"	14
93.5	1	"	"	17
93.1	2	"	"	21
92.2	4	"	"	30
91.6	1	"	"	37
90.8	1	"	"	45
90.6	1	"	"	47

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3089.9	1n	0.87	9.2	32354
89.7	1	"	"	56
89.2	1	"	"	62
88.8	1	"	"	66
88.2	1	"	"	72
87.7	6	"	"	77
86.6	1	"	"	89
86.3	1	"	"	92
85.7	2	"	"	98
85.0	1	"	"	407
84.5	2	"	"	11
84.3	1	"	"	13
83.3	2	"	"	24
83.0	1	"	9.3	27
82.3	4	"	"	34
82.0	1	"	"	37
81.7	2	"	"	40
80.5	2	"	"	53
80.0	2n	"	"	58
78.7	2	"	"	72
78.1	2	"	"	78
77.7	6	"	"	83
76.6	1	"	"	94
76.3	1	"	"	97
75.6	1	"	"	505
75.3	1	"	"	08
74.6	1	"	"	15
74.3	2	"	"	18
73.4	1	"	"	28
73.3	1	"	"	29
73.0	1	"	"	32
72.5	1n	"	"	37
72.0	1	"	"	43
71.5	1n	"	"	48
71.0	1	"	"	53
70.7	1	"	"	57
70.1	1	"	"	63
70.0	1	"	"	64
69.2	1	"	"	72
69.0	1	"	"	75
68.9	1	"	"	76
68.6	1	"	"	79
68.1	1	"	"	84
67.7	1	"	"	88
67.3	1	"	"	94
66.7	1	"	"	99
66.4	1	"	"	602
65.9	1	"	"	08
65.7	1	"	"	10
65.2	2	"	"	15
64.7	1n	"	"	21
64.4	2	"	"	24
63.9	1	"	"	29
63.5	1	"	"	32
62.1	1	0.86	"	48

MOLYBDENUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3061.6	1	0.86	9.3	32654
61.3	1	"	"	57
60.9	2	"	"	61
60.1	2	"	"	70
59.2	1	"	"	79
58.7	2	"	"	85
58.0	2	"	"	92
56.9	1	"	"	703
56.7	1	"	"	14
55.7	1	"	"	17
55.6	1	"	"	18
55.3	1	"	"	21
54.9	1	"	"	25
54.8	1	"	"	27
53.6	2	"	"	39
52.3	2	"	9.4	53
51.3	1	"	"	63
50.4	1	"	"	73
50.2	1	"	"	75
49.7	1	"	"	80
49.2	1	"	"	86
49.0	2	"	"	88
48.2	2	"	"	97
47.4	1	"	"	805
46.8	1	"	"	12
46.4	2	"	"	16
45.7	2	"	"	24
44.8	1n	"	"	33
44.0	2	"	"	42
43.5	1	"	"	50
43.0	1	"	"	53
42.1	2	"	"	63
41.8	2	"	"	66
41.2	2	"	"	72
39.9	1	"	"	86
39.2	1	"	"	94
38.8	1	"	"	99
37.5	1	"	"	913
37.1	1	"	"	17
36.3	1	"	"	25
35.5	1	"	"	34
35.4	1	"	"	35
35.0	2	"	"	40
34.3	1	"	"	47
33.9	1	"	"	51
33.4	2	"	"	52
32.0	1	"	"	72
30.8	1	"	"	85
30.3	2	"	"	91
30.0	1	"	"	94
29.9	1	"	"	95
29.2	1	"	"	33003
28.3	1	"	"	12
28.0	1	"	"	16
27.7	1n	"	"	19

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3026.8	2	0.86	9.4	3.3029
†25.9	2	"	"	39
25.0	1	"	"	48
24.9	1	"	"	49
23.3	4	"	9.5	67
22.8	2	0.85	"	72
21.7	4	"	"	84
20.8	2	"	"	94
19.8	1	"	"	105
19.1	1	"	"	13
18.5	4	"	"	20
17.4	2	"	"	32
16.9	2	"	"	37
16.3	1	"	"	44
16.0	1	"	"	47
15.4	2	"	"	54
14.7	1	"	"	61
14.3	2	"	"	64
13.4	1	"	"	76
12.8	1	"	"	82
12.2	1	"	"	89
12.0	2	"	"	91
11.2	1	"	"	200
11.0	2	"	"	02
10.0	1	"	"	13
09.8	1	"	"	15
09.5	1	"	"	19
08.8	1	"	"	26
08.2	4	"	"	32
07.8	1	"	"	37
07.4	2	"	"	42
07.0	1	"	"	46
06.8	1	"	"	48
05.5	2	"	"	63
05.1	1	"	"	69
04.5	4	"	"	74
04.0	1	"	"	79
03.8	2	"	"	82
03.3	1	"	"	87
02.8	1	"	"	93
02.2	1	"	"	99
01.9	1	"	"	303
01.5	1	"	"	07
00.9	1	"	"	13
00.4	4	"	"	19
2999.8	1	"	"	26
98.9	1	"	"	36
98.3	1	"	"	43
98.0	1	"	"	46
97.7	1	"	"	49
97.3	2	"	9.6	54
97.2	1	"	"	55
96.7	1	"	"	60
96.3	2	"	"	65
95.6	1	"	"	73



MOLYBDENUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
2995.4	1	0.85	9.6	33375
95.0	1	"	"	79
94.8	1	"	"	82
93.9	1	"	"	92
93.6	2	"	"	95
92.9	2	"	"	403
92.8	2	"	"	04
92.3	2	"	"	08
91.7	1n	"	"	16
91.1	1	"	"	23
90.8	1	"	"	26
90.3	1	"	"	31
89.9	2	"	"	36
89.5	1	"	"	41
88.8	1	"	"	49
88.6	2	"	"	51
88.0	1	"	"	58
87.4	1	"	"	64
87.0	2	"	"	69
86.2	2	"	"	78
86.0	1n	"	"	80
85.2	1	"	"	89
84.9	1	"	"	92
83.9	2	"	"	504
83.6	2	"	"	07
82.7	1	0.84	"	17
82.4	1	"	"	20
82.0	1	"	"	25
81.5	1	"	"	31
81.2	1	"	"	34
80.8	1	"	"	38
80.5	1	"	"	42
79.8	2	"	"	50
79.6	1	"	"	52
78.7	2	"	"	62
77.8	2	"	"	72
77.0	2	"	"	81
76.0	1	"	"	93
75.6	2	"	"	97
75.4	4	"	"	99
74.8	1	"	"	606
74.3	1	"	"	12
74.0	1	"	"	15
72.6	4	"	"	31
71.8	4	"	"	40
71.1	2	"	"	48
70.4	1	"	9.7	56
69.7	1	"	"	64
69.3	2	"	"	68
68.7	2	"	"	75
68.5	1	"	"	77
67.3	1	"	"	91
67.0	2	"	"	94
66.7	2	"	"	98
65.3	2	"	"	714

## MOLYBDENUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$ •	$\frac{1}{\lambda} -$	
2965.1	1	0.84	9.7	33716
64.5	1	"	"	23
63.8	2	"	"	31
63.0	1	"	"	40
62.4	1	"	"	47
61.4	2	"	"	58
61.2	1	"	"	60
60.4	1	"	"	70
60.3	2	"	"	71
58.7	1	"	"	89
58.1	1	"	"	96
57.7	1	"	"	800
57.1	2	"	"	07
56.0	2	"	"	20
55.9	2	"	"	21
55.2	2	"	"	29
†54.5	1	"	"	37
53.9	2	"	"	44
53.7	1	"	"	46
52.8	2	"	"	56
52.0	2	"	"	66
51.6	1	"	"	71
50.9	1	"	"	78
50.1	1	"	"	87
49.4	1	"	"	95
48.9	1	"	"	902
48.8	1	"	"	03
48.2	1	"	"	09
47.3	2	"	"	19
46.9	2	"	"	24
46.7	1	"	"	26
46.1	4	"	"	33
44.8	2	"	9.8	48
44.1	1	"	"	56
43.4	2	"	"	64
42.7	1	0.83	"	72
42.6	1	"	"	74
42.4	1	"	"	76
41.9	1	"	"	82
41.3	4	"	"	89
40.8	1	"	"	94
40.2	1	"	"	34001
39.3	1	"	"	11
38.3	4n	"	"	23
37.8	1n	"	"	29
36.9	2	"	"	40
35.7	1	"	"	54
35.2	2	"	"	60
34.2	2	"	"	73
33.2	1	"	"	84
32.2	2	"	"	96
31.6	1	"	"	103
30.5	4	"	"	14
30.1	2	"	"	18
29.5	1	"	"	25

MOLYBDENUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2928.5	2	0.83	9.8	34137
27.6	2	"	"	48
26.9	1	"	"	56
26.2	1	"	"	64
25.5	1	"	"	73
24.5	1	"	"	84
23.4	4	"	"	98
22.8	2	"	"	205
22.2	1	"	"	12
22.0	1	"	"	13
21.5	1	"	"	19
20.2	1	"	9.9	34
19.3	2	"	"	45
18.9	4	"	"	50
17.9	1	"	"	62
17.2	2	"	"	70
16.5	1	"	"	78
16.0	2	"	"	84
15.4	1	"	"	91
14.9	1	"	"	97
14.3	2	"	"	304
13.3	1n	"	"	16
12.5	1	"	"	25
11.7	2	"	"	35
10.9	1	"	"	44
09.9	1	"	"	56
09.2	2	"	"	64
08.2	1	"	"	75
08.0	1	"	"	78
07.2	2	"	"	87
06.0	2	"	"	92
05.4	1	"	"	409
05.3	1	"	"	10
05.0	1	"	"	14
04.5	1	"	"	19
04.3	1	"	"	22
03.2	6	0.82	"	30
02.0	2	"	"	49
01.0	2	"	"	61
00.7	2	"	"	64
2899.2	2	"	"	82
98.7	1	"	"	88
97.8	2	"	"	99
97.6	1	"	"	501
96.9	1	"	10.0	10
96.5	1	"	"	14
95.1	1	"	"	31
95.0	1	"	"	32
94.7	2	"	"	36
93.9	1	"	"	45
93.0	4	"	"	56
92.3	1	"	"	64
91.4	2	"	"	75
91.2	4	"	"	78
89.7	1n	"	"	96

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2888.8	1	0.82	10.0	34606
88.2	1	"	"	13
87.2	2	"	"	26
86.2	1	"	"	38
85.8	1	"	"	43
84.9	1	"	"	54
84.3	1	"	"	61
84.1	1	"	"	63
83.4	1	"	"	71
82.6	2	"	"	81
82.2	2n	"	"	86
81.7	1	"	"	92
81.6	2	"	"	93
80.0	2	"	"	712
79.2	2	"	"	22
77.7	1	"	"	40
77.0	2	"	"	48
75.8	1n	"	"	63
75.0	2	"	"	73
73.8	1	"	"	87
73.1	2	"	10.1	96
71.7	6	"	"	812
70.0	1n	"	"	33
69.8	1	"	"	35
69.3	1	"	"	41
69.0	1	"	"	45
68.5	2	"	"	51
68.3	2	"	"	53
67.8	1n	"	"	59
66.8	2	"	"	72
65.9	1	"	"	83
65.7	1	"	"	85
65.4	1	0.81	"	89
64.9	1	"	"	95
64.6	1	"	"	99
63.4	4	"	"	913
62.0	1	"	"	30
60.9	1	"	"	44
60.0	2	"	"	55
59.0	1	"	"	67
58.2	1	"	"	77
57.3	1	"	"	88
57.1	1	"	"	90
56.1	2	"	"	35003
56.0	2	"	"	04
54.8	1	"	"	18
54.2	1	"	"	25
53.7	2	"	"	31
53.3	6	"	"	37
51.3	1	"	"	61
50.7	1	"	"	69
49.8	1	"	"	80
49.4	1	"	"	85
48.3	8	"	10.2	98
46.7	1	"	"	118



MOLYBDENUM.—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2846.3	1	0.81	10.2	35123
45.7	1	"	"	30
45.0	1	"	"	39
44.5	1n	"	"	46
44.0	1	"	"	52
43.4	1	"	"	58
42.7	2	"	"	67
42.4	4	"	"	71
42.0	2	"	"	76
39.2	1	"	"	210
38.6	1	"	"	18
38.4	1	"	"	21
37.4	1	"	"	33
36.7	1	"	"	42
36.5	1	"	"	45
35.4	1	"	"	58
35.0	2	"	"	63
34.5	2	"	"	69
33.5	1	"	"	82
32.8	2	"	"	91
32.3	2	"	"	97
31.7	2	"	"	304
30.7	1	"	"	17
30.1	1	"	"	24
29.2	1	"	"	35
29.0	1	"	"	38
27.9	4	"	"	52
27.3	1	"	"	59
26.7	1	"	"	67
26.1	1	"	"	73
25.9	1	"	"	77
25.4	1	"	"	83
25.2	1	"	"	85
24.3	1	0.80	"	97
24.0	1	"	"	401
23.4	2	"	10.3	09
23.1	1	"	"	12
22.4	1	"	"	21
22.1	1	"	"	24
21.9	2	"	"	26
20.2	2n	"	"	48
19.9	1	"	"	52
17.6	2	"	"	81
16.2	3	"	"	99
14.8	2	"	"	516
14.2	1	"	"	24
13.7	1	"	"	30
13.3	1	"	"	35
12.7	1	"	"	43
11.2	2	"	"	62
10.5	2n	"	"	71
09.0	1	"	"	90
08.7	1	"	"	93
08.5	1	"	"	96
07.8	6	"	"	605

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2807.2	2	0.80	10.3	35612
06.3	2	"	"	24
05.1	1	"	"	39
04.6	1	"	"	45
04.2	1	"	"	50
03.3	1	"	"	63
02.5	1	"	"	72
01.4	2	"	"	86
01.2	1	"	"	89
01.0	1	"	"	91
00.6	2	"	"	96
00.4	1	"	"	99
2799.2	2	"	10.4	714
99.0	1	"	"	17
98.2	1	"	"	27
97.2	2n	"	"	40
96.8	1	"	"	45
95.6	1	"	"	60
94.8	1	"	"	70
94.2	1	"	"	78
93.2	1	"	"	91
92.6	1	"	"	99
91.7	1	"	"	810
90.5	1	"	"	26
89.0	1n	"	"	45
87.9	1	"	"	59
87.5	1	"	"	64
85.1	4	"	"	95
84.2	2n	0.79	"	907
83.3	1	"	"	19
82.0	1	"	"	35
81.5	1	"	"	41
80.2	6	"	"	58
79.4	2	"	"	68
78.4	1	"	"	81
77.9	1	"	"	88
76.7	1	"	"	36003
75.4	6	"	10.5	20
74.5	2	"	"	32
73.8	2n	"	"	41
71.9	1	"	"	66
70.7	1	"	"	82
69.7	2	"	"	94
68.8	1n	"	"	106
67.7	1	"	"	20
67.0	1	"	"	30
66.3	1	"	"	39
66.1	1	"	"	42
65.2	1	"	"	53
64.5	1	"	"	63
63.8	2	"	"	72
63.5	4	"	"	75
62.9	2	"	"	83
62.6	1	"	"	90
61.6	1	"	"	200

MOLYBDENUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2760.7	2	0.79	10.5	36212
60.0	1	"	"	21
59.6	1	"	"	26
59.2	1	"	"	32
58.7	2	"	"	38
57.3	2	"	"	57
56.0	4	"	"	74
55.5	1	"	"	81
54.7	1n	"	"	91
54.0	1	"	"	300
52.4	1	"	"	21
51.6	1	"	"	32
50.0	2	"	10.6	53
49.3	1	"	"	62
48.5	1	"	"	73
47.7	1	"	"	83
47.1	1	"	"	91
47.0	1	"	"	93
46.2	4	"	"	403
45.2	1	"	"	17
44.2	1	"	"	30
43.1	2	"	"	44
42.9	2	"	"	47
41.6	2	0.78	"	64
41.5	2	"	"	65
40.2	1n	"	"	83
39.5	1	"	"	92
38.7	1	"	"	503
37.9	1	"	"	14
37.0	1	"	"	26
36.5	1	"	"	33
35.9	1	"	"	40
35.4	1	"	"	47
35.0	1	"	"	52
34.0	1	"	"	66
33.2	2	"	"	78
32.8	4	"	"	81
31.5	1	"	"	99
30.8	1	"	"	608
30.2	2	"	"	17
29.8	2	"	"	21
28.8	2	"	"	35
26.9	1	"	10.7	61
26.0	1	"	"	73
25.1	1n	"	"	85
24.0	2	"	"	700
23.3	1	"	"	10
22.5	1	"	"	21
21.8	1	"	"	30
21.2	1	"	"	38
20.2	1	"	"	51
19.8	1n	"	"	57
19.0	1	"	"	68
18.1	1n	"	"	80
17.3	4	"	"	91

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2716.2	1	0.78	10.7	36805
15.5	1n	"	"	15
14.5	1	"	"	29
13.5	1	"	"	43
13.0	1	"	"	49
12.3	2	"	"	58
11.5	2	"	"	70
10.9	2	"	"	77
10.2	1	"	"	87
09.8	2	"	"	92
08.6	1	"	"	903
07.8	1	"	"	20
07.0	1	"	"	31
06.2	1	"	"	42
05.0	1	"	"	58
04.2	1	"	"	69
03.9	1	"	"	73
03.0	1	"	10.8	85
02.4	1	"	"	93
01.8	1	"	"	37001
01.3	4	"	"	08
00.6	1	"	"	17
2699.5	1	"	"	33
98.3	1	0.77	"	49
97.8	1	"	"	56
97.3	1	"	"	63
96.9	2	"	"	69
95.9	1	"	"	83
95.2	2	"	"	92
93.9	2	"	"	110
93.2	2	"	"	19
93.0	1	"	"	23
92.7	2	"	"	27
91.8	2n	"	"	40
91.1	1	"	"	49
90.1	1	"	"	63
89.7	1	"	"	69
88.9	1	"	"	78
88.0	4	"	"	92
87.1	1	"	"	205
85.9	2	"	"	21
85.2	1	"	"	31
84.2	2	"	"	45
83.2	2	"	"	59
82.5	1	"	"	68
81.5	4	"	"	82
80.6	1n	"	"	95
80.0	1	"	"	303
79.8	1	"	"	06
78.6	1	"	10.9	22
77.8	1	"	"	33
77.1	2	"	"	43
76.5	4	"	"	55
75.7	1	"	"	62
74.9	1	"	"	74



MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2672.9	4	0.77	10.9	37401
72.0	4	"	"	14
71.1	2	"	"	27
70.1	2	"	"	41
59.7	2	"	"	46
69.3	2	"	"	52
63.2	1	"	"	68
67.5	2	"	"	77
66.8	2	"	"	87
66.4	1	"	"	93
65.1	2	"	"	511
63.9	1	"	"	28
63.1	1	"	"	39
62.7	1	"	"	45
61.9	1	"	"	56
61.2	1	"	"	66
60.6	4	"	"	75
59.7	1n	"	"	87
59.3	1	"	"	93
59.0	1	"	"	97
58.1	1	"	"	610
57.0	1	"	"	26
55.9	1	"	"	41
55.6	1	"	"	45
55.2	1	"	11.0	51
55.0	1	0.76	"	54
53.8	1	"	"	71
53.2	4	"	"	79
52.2	2n	"	"	94
51.7	2	"	"	701
51.0	1	"	"	11
50.7	1	"	"	15
50.0	1	"	"	25
49.5	1n	"	"	32
48.1	1	"	"	52
48.0	1	"	"	53
47.6	1	"	"	59
47.1	1	"	"	66
46.3	4	"	"	78
44.2	4	"	"	808
42.8	1	"	"	28
42.3	2	"	"	35
42.1	1	"	"	38
41.0	4	"	"	53
39.7	1	"	"	72
39.4	1	"	"	76
38.8	4	"	"	85
38.7	4	"	"	86
38.3	2n	"	"	92
37.1	1	"	"	909
36.7	2	"	"	15
35.4	1	"	"	34
35.1	1	"	"	38
34.7	1	"	"	43
34.0	1	"	"	54

## MOLYBDENUM --continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2633.5	2	0.76	11.0	37961
33.1	1 <sub>n</sub>	"	"	67
31.6	1	"	11.1	89
31.2	1	"	"	94
31.0	1	"	"	97
30.7	2	"	"	38001
30.3	1	"	"	07
29.9	1	"	"	13
29.7	1	"	"	16
29.3	1	"	"	22
28.8	1	"	"	29
28.4	1	"	"	35
28.0	1	"	"	41
27.5	1	"	"	48
27.2	1	"	"	53
26.2	2	"	"	67
25.9	2 <sub>n</sub>	"	"	71
25.5	1	"	"	77
25.3	1	"	"	80
24.8	1	"	"	87
24.4	1	"	"	93
23.4	1	"	"	107
22.5	1	"	"	20
22.0	1	"	"	28
21.7	1	"	"	32
20.8	1	"	"	46
20.1	1	"	"	56
19.8	1	"	"	60
18.0	1	"	"	86
17.6	1	"	"	92
17.2	1	"	"	97
16.9	1	"	"	202
16.7	1	"	"	04
15.7	1	"	"	19
15.5	1	"	"	22
15.2	1	"	"	26
14.5	1	"	"	37
13.8	1	"	"	47
13.2	1	"	"	56
12.2	1	"	"	70
11.9	1	"	"	75
11.2	1	"	"	85
10.9	1	"	11.2	90
10.2	1	"	"	300
09.4	2	0.75	"	12
09.0	2	"	"	18
08.5	1	"	"	26
07.9	1	"	"	34
07.4	1	"	"	41
07.2	1	"	"	44
06.7	1	"	"	52
05.9	2	"	"	63
05.7	1	"	"	66
05.2	2	"	"	74
04.7	1	"	"	81

MOLYBDENUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2604.6	1	0.75	11.2	38383
03.8	1	"	"	94
03.4	1	"	"	400
02.9	2	"	"	07
02.7	2	"	"	11
02.0	2	"	"	21
01.6	1	"	"	27
01.2	1	"	"	33
00.9	1	"	"	37
00.2	1	"	"	47
2599.6	1	"	"	56
99.4	1	"	"	59
98.5	1	"	"	73
97.4	2	"	"	88
97.2	2	"	"	92
96.7	1	"	"	99
95.3	4	"	"	520
93.7	2	"	"	44
93.4	4	"	"	49
92.8	1	"	"	57
91.8	2	"	"	72
91.0	ln	"	"	84
90.2	1	"	"	96
89.8	ln	"	"	602
88.9	2	"	"	15
88.0	1	"	11.3	28
87.5	2	"	"	36
87.2	2	"	"	41
†86.1	2	"	"	57
85.2	1	"	"	70
84.2	1	"	"	85
84.0	1	"	"	88
82.5	ln	"	"	711
81.2	1	"	"	30
80.5	ln	"	"	40
79.5	2	"	"	56
79.0	2	"	"	63
78.4	2	"	"	72
76.2	1	"	"	806
75.9	1	"	"	10
75.5	1	"	"	16
74.5	2	"	"	31
73.8	1	"	"	42
73.0	ln	"	"	54
72.3	2	"	"	64
71.4	2	"	"	78
71.3	2	"	"	80
71.0	2n	"	"	84
68.2	1	"	11.4	926
67.6	1	"	"	35
67.2	ln	"	"	42
66.3	1	"	"	55
65.7	ln	"	"	64
65.2	1	"	"	72
64.9	1	0.74	"	76

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2564.4	2	0.74	11.4	38984
63.6	1	"	"	96
63.3	1	"	"	39001
62.7	1	"	"	10
62.3	1	"	"	16
60.7	1	"	"	40
60.3	1n	"	"	47
59.7	2	"	"	56
59.2	2	"	"	63
58.9	2	"	"	68
58.2	1	"	"	79
57.9	1	"	"	83
57.4	2	"	"	91
56.8	1	"	"	100
56.5	1	"	"	15
55.6	1	"	"	20
55.0	1n	"	"	28
53.8	1n	"	"	46
53.2	1n	"	"	55
52.8	1n	"	"	61
52.6	1	"	"	64
52.4	1	"	"	67
52.2	1	"	"	70
52.0	1	"	"	74
50.8	2	"	"	92
49.3	1	"	"	215
49.1	1	"	11.5	18
48.2	1n	"	"	32
47.6	2	"	"	41
47.5	2	"	"	43
45.8	1	"	"	69
45.1	1	"	"	80
44.5	1	"	"	89
44.3	2	"	"	92
43.6	1	"	"	303
42.9	2	"	"	14
41.5	1n	"	"	85
41.1	1	"	"	42
40.7	1	"	"	48
40.3	1	"	"	54
39.5	1	"	"	66
38.5	6	"	"	82
37.6	1	"	"	96
36.9	1	"	"	407
36.8	1	"	"	08
35.7	1	"	"	25
35.5	1n	"	"	28
35.0	1	"	"	36
34.6	1	"	"	42
33.8	1	"	"	55
32.8	1	"	"	70
32.5	1	"	"	75
31.5	1	"	"	91
31.0	1	"	"	99
30.9	1	"	"	500



MOLYBDENUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2529.9	2	0.74	11.6	39516
29.0	1	"	"	30
28.5	1	"	"	38
27.3	2	"	"	56
26.8	1n	"	"	64
26.5	1n	"	"	69
25.5	1	"	"	85
24.8	2	"	"	95
23.9	2n	"	"	610
23.3	2	"	"	19
23.0	1	"	"	24
22.8	2	"	"	27
22.0	1	"	"	39
21.3	1	"	"	50
20.7	1	"	"	60
19.8	1	"	"	74
19.3	1	"	"	82
19.2	1	"	"	84
18.8	2	"	"	90
18.7	2	"	"	91
17.7	1n	0.73	"	707
16.3	1	"	"	29
15.7	1	"	"	39
15.3	1	"	"	45
14.3	1	"	"	61
14.1	1	"	"	64
13.3	1	"	"	77
12.7	1	"	"	86
12.5	1	"	"	89
12.2	1	"	"	94
11.8	1n (C)	"	11.7	800
11.3	1	"	"	08
10.6	1	"	"	19
09.3	1	"	"	40
08.3	1 (C) (?)	"	"	56
07.3	1	"	"	72
06.8	1	"	"	80
†06.3	1	"	"	87
05.8	1	"	"	96
04.6	1	"	"	915
04.4	1	"	"	17
04.0	1	"	"	24
03.8	2	"	"	27
03.4	1	"	"	35
02.3	1	"	"	51
01.8	1	"	"	59
01.5	1	"	"	64
00.8	1n	"	"	75
2499.8	1	"	"	91
99.4	1	"	"	97
99.1	1	"	"	40003
98.3	1	"	"	16
98.2	2	"	"	17
98.0	2	"	"	20
97.5	2	"	"	28

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2497.2	1	0.73	11.7	40038
96.6	1	"	"	42
96.3	1	"	"	47
96.2	1	"	"	49
95.6	1	"	"	59
94.8	1	"	"	71
94.5	1	"	"	76
94.3	1	"	"	80
94.1	1	"	11.8	82
93.3	1	"	"	96
93.1	1n	"	"	100
92.8	1	"	"	04
91.8	2	"	"	20
91.4	1	"	"	27
90.9	1	"	"	34
90.1	2	"	"	48
89.3	1	"	"	60
89.0	1	"	"	65
88.3	1	"	"	76
87.8	2	"	"	84
87.2	1	"	"	94
86.7	2n	"	"	202
86.3	1	"	"	09
84.9	2	"	"	31
84.7	2	"	"	34
84.3	1	"	"	41
83.9	1	"	"	47
83.5	1	"	"	54
83.2	1	"	"	58
82.7	2	"	"	66
82.2	1	"	"	75
81.3	2	"	"	89
80.4	1	"	"	303
79.5	2	"	"	19
78.8	1C	"	"	30
78.5	1	"	"	35
78.2	1	"	"	40
78.0	1	"	"	43
77.8	4	"	"	46
76.2	1n	"	11.9	72
74.3	2	"	"	403
72.0	1	"	"	41
70.3	1	"	"	69
69.3	2	0.72	"	85
69.0	2	"	"	90
68.6	1	"	"	97
68.1	2	"	"	505
67.5	2	"	"	14
67.1	2	"	"	21
66.8	4	"	"	26
66.2	1	"	"	35
63.8	1	"	"	75
63.4	1	"	"	82
62.7	2	"	"	94
62.1	2	"	"	604

MOLYBDENUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2461.4	1	0.72	11.9	40615
61.2	1	"	"	18
60.0	1	"	12.0	42
58.8	1	"	"	58
57.9	4	"	"	73
57.2	1	"	"	85
57.0	1	"	"	88
56.5	1	"	"	96
55.6	4	"	"	711
53.9	1	"	"	39
53.5	1	"	"	46
53.3	2	"	"	50
52.3	1	"	"	66
51.5	1	"	"	79
51.0	1	"	"	88
50.5	1	"	"	96
49.9	1	"	"	806
48.6	1	"	"	28
47.5	1	"	"	46
47.2	1n	"	"	51
46.5	2n	"	"	63
44.9	1	"	"	99
44.8	1	"	"	91
43.3	2	"	12.1	918
41.2	1	"	"	53
40.3	2	"	"	67
40.2	1	"	"	68
39.3	2	"	"	84
38.6	1	"	"	95
38.4	2	"	"	99
37.8	4	"	"	41009
36.1	4	"	"	37
34.4	1	"	"	66
33.0	1n	"	"	90
30.4	1	"	"	134
30.2	1	"	"	37
29.6	1	"	"	47
28.9	2	"	"	59
28.3	1	"	"	69
27.6	1	"	12.2	81
25.8	1n	"	"	211
25.2	1	"	"	21
24.3	1n	"	"	36
†24.1	2	"	"	40
22.2	4	"	"	72
21.7	1	0.71	"	81
21.3	1	"	"	88
20.9	1	"	"	95
20.3	1	"	"	305
19.0	2	"	"	27
18.7	1	"	"	33
18.1	1	"	"	43
17.4	1	"	"	55
16.2	1	"	"	75
15.7	1	"	"	84

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
2414.8	1	0.71	12.2	41399
13.5	1	"	"	422
13.2	2	"	"	27
12.8	4	"	12.3	33
11.9	2	"	"	49
11.3	1	"	"	58
11.0	2	"	"	64
10.6	1	"	"	74
10.3	2	"	"	76
08.8	2 <sub>n</sub>	"	"	502
07.2	1	"	"	30
06.8	2	"	"	37
05.0	1	"	"	68
†04.8	1	"	"	72
03.7	2	"	"	91
02.8	1	"	"	606
02.0	2	"	"	20
00.4	1	"	"	48
†2399.5	1	"	"	63
98.1	1	"	"	87
97.3	1	"	12.4	721
96.0	1	"	"	24
95.8	1	"	"	27
95.2	1	"	"	38
94.7	1	"	"	46
93.6	1	"	"	66
92.7	2	"	"	81
91.9	2	"	"	95
91.0	2	"	"	811
90.6	2	"	"	18
90.3	1	"	"	23
90.0	1	"	"	29
89.3	2	"	"	41
89.1	2	"	"	45
88.8	2	"	"	50
88.2	1	"	"	60
87.1	2	"	"	80
86.2	1	"	"	95
84.8	1	"	"	920
84.1	1	"	"	32
83.5	1	"	"	43
82.5	1	"	12.5	60
81.7	1	"	"	74
81.3	2	"	"	80
80.3	1	"	"	98
79.0	1 <sub>n</sub>	"	"	42022
78.1	1	"	"	38
77.3	4	"	"	51
75.0	1	"	"	93
74.5	1	"	"	102
73.1	2	0.70	"	27
72.5	1	"	"	37
72.1	1	"	"	44
71.8	1	"	"	50
70.6	1	"	"	71



MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2370.5	1	0.70	12.5	42173
70.4	2	"	"	74
69.2	1	"	"	96
68.9	1	"	"	201
67.9	2	"	12.6	19
67.2	2	"	"	31
66.3	4	"	"	47
65.3	1	"	"	65
63.9	1	"	"	90
63.2	2	"	"	303
62.6	1	"	"	14
60.0	2	"	"	60
57.9	1	"	"	98
57.8	1	"	"	400
57.3	2	"	"	09
56.6	1	"	"	21
55.6	1	"	"	39
54.1	1	"	12.7	66
50.1	2	"	"	539
49.0	1	"	"	59
48.8	1	"	"	62
48.2	1	"	"	73
47.8	2	"	"	80
47.6	1	"	"	84
46.8	1	"	"	99
44.8	1	"	"	635
44.3	ln	"	"	44
43.1	2	"	"	66
41.8	2	"	"	89
40.5	4	"	12.3	713
39.8	1	"	"	26
39.4	1	"	"	33
39.0	1	"	"	41
38.5	1	"	"	50
38.2	1	"	"	55
37.4	1	"	"	70
36.6	ln	"	"	84
34.9	1	"	"	816
34.4	1	"	"	25
34.3	1	"	"	27
32.8	1	"	"	54
32.3	1	"	"	63
31.0	4	"	"	87
30.1	1	"	"	904
29.8	2	"	"	09
28.8	ln	"	"	28
27.0	ln	"	12.9	61
26.8	1	"	"	65
25.6	4	0.69	"	87
24.9	1	"	"	43000
24.1	1	"	"	15
22.2	ln	"	"	31
22.4	ln	"	"	46
20.3	1	"	"	85
20.2	1	"	"	87

MOLYBDENUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2318.0	2	0.69	12.9	43128
16.6	1	"	"	54
16.4	1	"	"	58
14.3	1n	"	13.0	97
10.0	1	"	"	277
09.5	1	"	"	86
08.0	2n	"	"	315
07.0	1	"	"	33
06.5	2	"	"	43
04.3	1	"	"	84
02.9	1	"	"	411
2298.3	2n	"	13.1	97
97.0	1	"	"	522
96.6	1	"	"	30
95.1	2	"	"	58
91.8	1	"	"	621
91.0	1	"	"	36
90.3	1	"	"	49
90.1	1	"	"	53
89.2	2	"	"	70
86.5	1	"	13.2	722
86.0	1	"	"	31
81.3	1	"	"	821
80.8	2	0.68	"	31
76.4	2	"	"	916
75.8	4n	"	13.3	27
75.1	2	"	"	41
73.2	1	"	"	78
69.8	1	"	"	44043
68.8	1	"	"	63
64.8	1n	"	"	141
57.2	2	"	13.4	289
53.4	1	"	"	364
52.6	1	"	"	80
51.5	1	"	"	401
50.3	1	"	13.5	25
49.2	1n	"	"	47
47.8	1	"	"	74
42.3	1	"	"	584
41.2	1	"	"	605
40.8	1	"	"	13
39.4	2	"	"	41
36.3	1n	0.67	13.6	703
31.0	1	"	"	809
27.1	1	"	"	88
23.3	1	"	13.7	965
21.3	1	"	"	45005
18.3	1	"	"	66
14.3	1n	"	13.8	147
10.7	1	"	"	220

CORONIUM.—5303.27 not coincident with the chromospheric line 5316.9 (1474).  
Campbell: 'Astrophys. J.,' Oct. 1899.

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# APPENDIX L.

## GALLIUM (ULTRA-VIOLET) SPARK SPECTRUM.

Exner and Haschek, 'Sitzungsber. kais. Akad. Wissensch. Wien.' cviii. (2) 1899.  
Hartley and Ramage, 'Astroph. Journ.' ix. p. 214 (1899).

Wave-length	Intensity and Character	Reduction to Vacuum.		Oscillation Frequency
		$\lambda +$	$\frac{1}{\lambda} -$	
4172.25*	20r	1.15	6.7	23961.1
4085.45	1n	1.12	6.9	24470.2
79.2	1b		"	508
54.18	1		"	659.0
33.19*	10r	1.11	7.0	787.3
3710.46	1	1.03	7.6	26943.2
07.40	1n		"	965.5
06.5	1n		"	972
03.00	1n		"	997.5
3361.4	1b	0.94	8.4	29741
49.5	1n	"	8.5	847
2944.31	1n	0.84	9.7	33954.1
43.81	2n	"	9.8	959.8
2874.32	2n	0.82	10.0	34780.8
2780.28	1n	0.79	10.4	35957.2
2481.1	1n	0.73	11.8	40292.9

\* Coincident with solar lines—wave-lengths in the arc, 4172.214 and 4033.125 (Hartley and Ramage). See also Appendix D. p. 1.

## BROMINE (VACUUM-TUBE).

Eder and Valenta, 'Denkschr. kais. Akad. Wissensch. Wien,' Bd. lxxviii. 1899.

Wave-length (Rowland)	Intensity and Character	Previous Measurements (Rowland)		Reduction to Vacuum		Oscillation Frequency in Vacuo
		Salet	Plücker and Hittorf	$\lambda +$	$\frac{1}{\lambda} -$	
6682.83	2	6990	6862	1.81	4.0	14959.7
32.02	5	6631	6622	1.80	4.1	15074.3
6582.52	1	6581	6577	1.79	"	187.6
60.17	4	6556	6556	1.78	"	239.4
45.00	$\frac{1}{2}$			"	"	274.7
6353.07	1			1.73	4.3	736.1
51.02	10	6357	6358	"	"	741.2
6204.36	$\frac{1}{2}$			1.69	4.4	16113.3
6178.72	2			1.68	"	180.2
70.09	2			"	"	202.8
59.60	2			"	"	230.4
49.95	10	6166	6159	1.67	"	255.9
42.02	4		6152	"	"	276.9
23.49	3		6132	"	"	326.2
18.89	4		6129	"	"	338.4
6097.05	1			1.66	"	397.0



BROMINE (VACUUM-TUBE)—*continued.*

Wave-length (Rowland)	Intensity and Character	Previous Measurements (Rowland)		Reduction to Vacuum		Oscillation Frequency in Vacuo
		Salet	Plücker and Hittorf	$\lambda +$	$\frac{1}{\lambda} -$	
5954.3	$\frac{1}{2}$			1.62	4.6	16790
50.7	$\frac{1}{2}$			"	"	800
40.83	4			"	"	828.1
5871.97	3	5881		1.60	"	17025.5
68.40	2		5869	"	"	032.3
64.55	3			"	"	047.0
52.40	5			1.59	"	082.4
33.71	3			"	4.7	17137.2
31.04	7	5841	5828	"	"	144.9
21.40	3		5825	"	"	173.3
5794.50	2		5793	1.58	"	17253.0
—	—		5740	—	—	—
19.17	4	5721	5723	1.56	4.8	17480.3
16.5	$\frac{1}{2}$			"	"	488
11.25	4		5713	"	"	17504.5
—	—		5697	—	—	—
5657.83	4		5663	1.54	"	17669.8
43.40	$\frac{1}{2}$			"	"	17715.0
30.3	1			"	"	756
27.5	1b		5627	1.53	"	765
22.38	1		5623	"	"	781.3
21.95	1			"	"	782.6
5600.90	4	5601	5599	"	4.9	17849.4
5590.15	8			1.52	"	883.7
88.40	2			"	"	889.3
84.98	1			"	"	900.3
60.10	1		5567	"	"	980.4
45.91	1		5553	1.51	"	18026.4
39.21	1			"	"	048.2
36.52	4			"	"	057.0
32.38	$\frac{1}{2}$			"	"	070.5
29.19	2			"	"	080.9
16.87	1	5516	5516	"	"	18121.3
11.04	2			1.50	"	140.5
08.49	3			"	"	148.9
06.97	8			"	"	153.9
5495.24	7	5501	5503	"	5.0	192.6
89.00	6	5496	5493	"	"	18213.2
83.20	2			"	"	232.5
81.41	2			"	"	238.5
80.20	3b			"	"	242.5
66.43	5			1.49	"	288.5
50.28	3	5451	5447	"	"	18342.7
42.55	4			"	"	368.7
35.30	5		5437	1.48	"	393.2
33.49	1			"	"	399.4
25.21	5	5426	5429	"	"	18427.5
23.01	7		5423	"	"	434.9
5395.69	5		5392	1.47	5.1	18528.2
—	—		5384	"	"	—
70.51	2b <sup>v</sup>			"	"	18615.1
66.28	3b <sup>v</sup>			"	"	636.4
60.99	2			1.46	"	648.2
45.53	4b <sup>v</sup>			"	"	18702.1
35.30	5	5336	5327	"	"	738.0

BROMINE (VACUUM-TUBE)—*continued.*

Wave-length (Rowland)	Intensity and Character	Previous Measurements (Rowland)		Reduction to Vacuum		Oscillation Frequency in Vacuo
		Salet	Pllicker and Hittorf	$\lambda +$	$\frac{1}{\lambda} -$	
5333.49	1			1.46	5.1	18744.4
32.18	10			"	"	749.0
30.76	2			"	"	754.0
04.31	7			1.45	"	18847.5
—	—	5311	5300	"	"	—
5272.89	4	5276	5293	1.44	5.2	18963.3
63.68	4	5267	5264	"	"	992.9
49.219	3		5251	1.43	"	19045.26
39.994	2	5241	5226	"	"	078.79
38.472	8			"	"	084.34
33.65	2		5221	"	"	102.9
27.911	3		5217	"	"	129.4
—	—			"	"	—
5199.50	3			"	5.3	227.3
94.075	4b			1.42	"	247.4
84.074	4		5188	"	"	284.5
82.573	7			"	"	290.1
80.19	2	5186	5181	"	"	299.0
74.09	1			1.41	"	321.8
64.560	5	5166	5169	"	"	361.2
43.626	2		5151	"	"	436.3
—	—		5123	1.40	"	—
—	—		5107	"	"	—
—	—		5093	1.39	"	—
5054.853	4	5061	5055	"	5.4	777.6
38.962	3b		5036	1.38	"	840.0
20.756	3			1.37	5.5	911.8
11.000	1		5011	"	"	950.6
02.96	1			"	"	982.7
4987.234	1		4991	1.36	"	20045.7
79.950	4s		4983	"	"	075.0
59.51	4b		4961	"	"	157.8
45.768	3n		4956	1.35	"	213.8
42.21	1n			"	5.6	228.3
30.816	5s	4931	4933	"	"	275.0
28.966	5s		4925	"	"	282.6
26.758	2n			"	"	291.8
21.386	3n			"	"	313.9
21.20	1n			"	"	314.6
4867.935	3b		4869	1.33	"	537.0
66.851	3b			"	"	541.5
48.988	6s		4853	"	5.7	617.2
45.196	3b		4848	"	"	633.3
38.823	3			1.32	"	660.5
34.699	2n			"	"	678.1
16.900	8s	4816	48.9	"	"	754.5
02.544	4s		4808	1.31	"	816.6
4799.794	3n			"	"	828.5
98.415	3n			"	"	834.5
91.989	2n			"	"	862.5
85.644	10s	4786	4788	"	"	890.1
80.524	6s		4779	"	5.8	912.4
77.30	3s			"	"	926.5
76.605	7s			"	"	929.6
75.41	3s			"	"	934.8

BROMINE (VACUUM-TUBE)—*continued.*

Wave-length (Rowland)	Intensity and Character	Previous Measurements (Rowland)		Reduction to Vacuum		Oscillation Frequency in Vacuo
		Salet	Plücker and Hittorf	$\lambda +$	$\frac{1}{\lambda} -$	
4774.01	4s			1.31	5.8	20945.3
72.91	3b		4772	"	"	945.8
67.282	8s			1.30	"	970.5
66.27	5b <sup>v</sup>			"	"	975.0
53.05	1			"	"	21033.3
52.47	3b			"	"	035.9
50.10	2b			"	"	046.4
44.53	3b		4747	"	"	071.1
42.87	8s		4737	"	"	078.5
35.67	5b <sup>v</sup>		4731	"	"	110.5
28.90	2			1.29	"	140.8
28.49	4			"	"	142.6
20.56	1b <sup>v</sup>	4721	4721	"	"	178.1
19.95	8			"	"	180.9
17.57	3b			"	"	191.5
14.66	1n			"	"	205.0
11.32	1			"	"	219.7
08.16	1			"	"	233.9
05.00	10b	4706	4707	"	5.9	248.1
01.93	2n			"	"	262.0
4698.77	2n		4696	"	"	276.3
96.59	2n			"	"	286.1
93.48	8s			"	"	300.3
92.51	3b			1.28	"	304.7
91.42	3b			"	"	309.6
78.89	8b	4676	4681	"	"	366.7
75.82	2s		4677	"	"	380.7
73.56	2s			"	"	391.1
72.750	6s			"	"	394.8
66.42	2			"	"	423.8
52.18	6s			1.27	"	489.4
44.17	2n		4645	"	"	526.5
43.74	4s			"	"	528.4
42.35	3b			"	"	534.7
29.66	3b			"	6.0	593.9
22.99	8s	4621	4626	"	"	630.4
14.86	6s			1.26	"	662.6
05.90	2b			"	"	705.3
01.63	5n			"	"	725.4
4597.14	3n			"	"	746.7
75.95	6b <sup>v</sup>			1.25	"	847.4
58.21	4n			"	6.1	932.3
43.12 } 42.67 }	8s 2n	4543	4544	"	"	22005.2 007.4
38.95	5b			"	"	025.4
30.21	1			"	"	067.9
30.00	5s			"	"	069.0
29.78	2s			"	"	070.0
25.82	8b <sup>v</sup>			"	"	089.3
13.99	1			1.24	"	147.2
13.67	5s			"	"	148.8
08.29	2n			"	"	175.3
4477.96	5b <sup>v</sup>	4486		1.23	6.2	325.4
72.83	8			"	"	351.0
71.99	1			"	"	355.2

BROMINE (VACUUM-TUBE)—*continued.*

Wave-length (Rowland)	Intensity and Character	Previous Measurements (Rowland)		Reduction to Vacuum		Oscillation Frequency in Vacuo
		Salet	Plücker and Hittorf	$\lambda +$	$\frac{1}{\lambda} -$	
4470.22	1			1.23	6.2	22364.1
66.42	1n			1.22	"	383.1
65.99	1n			"	"	385.2
60.92	1			"	"	410.7
60.39	1			"	"	413.4
53.75	1			"	"	446.8
41.94	8b <sup>r</sup>			"	"	506.5
31.13	2			"	6.3	561.3
30.07	2			1.21	"	566.7
25.32	5s			"	"	590.9
23.22	2			"	"	601.7
12.66	1			"	"	655.8
07.80	4			"	"	680.8
05.18	1			"	"	694.3
4399.87	3			"	"	721.6
93.55	5			"	"	738.8
95.10	4			"	"	746.3
91.76	3			1.20	"	765.6
86.83	2n			"	"	789.2
78.11	4b			"	"	834.6
77.40	2s			"	"	838.3
72.20	3n			"	"	865.5
65.76	8s	4368	4366	"	6.4	899.2
65.31	4s.			"	"	901.5
4297.27	3s			"	6.5	23264.1
91.54	6	4287	4288	1.18	"	300.6
36.998	6s			"	6.6	595.0
30.101	4	4231	4242	1.17	"	633.4
23.996	8		4229	1.16	"	667.7
02.64	4s		4199	1.15	"	788.0
4193.62	6			"	6.7	839.0
93.34	2			"	"	840.6
79.76	8	4181	4182	"	"	918.1
75.92	5s			"	"	940.1
75.77	1			"	"	941.0
60.14	2s			1.14	"	24031.0
57.54	2			"	"	046.0
57.23	3s			"	"	047.8
51.52	3s			"	"	080.9
44.12	2s			"	6.8	123.8
40.37	6s		4143	"	"	145.6
38.78	3b			"	"	155.9
35.79	5s			"	"	172.4
17.58	3b			1.13	"	279.3
10.12	4			"	"	323.4
09.96	1			"	"	324.3
06.52	3s			"	"	344.7
05.56	2s			"	"	350.4
02.62	4			"	"	368.3
4096.27	3b			"	6.9	405.6
90.74	3s			1.12	"	438.5
89.29	3b	3981		"	"	447.2
75.66	4b			"	"	529.0
37.486	2s			1.11	7.0	760.9
36.538	4s			"	"	766.7



BROMINE (VACUUM-TUBE)—*continued.*

Wave-length (Rowland)	Intensity and Character	Previous Measurements (Rowland)		Reduction to Vacuum		Oscillation Frequency in Vacuo
		Salet	Plücker and Hittorf	$\lambda +$	$\frac{1}{\lambda}$	
4024.19	5b <sup>v</sup>			1.11	7.0	24842.7
22.04	2			"	"	856.0
21.95	1			"	"	856.6
12.70	3s			1.10	"	913.9
08.93	6b <sup>v</sup>			"	"	937.3
07.45	5s			"	"	946.5
05.69	2a			"	"	957.5
01.60	3b			"	7.1	982.9
3999.77	4b			"	"	994.3
97.27	4b			"	"	25010.0
92.51	4s			"	"	639.8
91.485	3s			"	"	044.2
86.666	8s			"	"	076.5
80.585	10n			"	"	114.8
80.151	5s			"	"	117.6
68.804	5s			1.09	"	189.4
55.504	8b <sup>v</sup>			"	7.2	274.6
50.745	7b <sup>v</sup>			"	"	304.5
39.862	5b <sup>v</sup>			"	"	374.4
38.801	5b <sup>v</sup>			"	"	381.2
35.310	6b <sup>v</sup>			1.08	"	403.8
29.726	6b			"	"	440.9
24.239	8b <sup>v</sup>			"	"	475.4
23.506	6			"	"	480.2
20.838	6b <sup>v</sup>			"	"	497.5
19.770	6s			"	"	504.5
17.960	3s			"	"	516.3
14.419	9			"	"	539.4
14.270	—			"	"	540.3
01.418	4			"	7.3	624.4
3891.790	8s			"	"	687.9
88.665	4b <sup>v</sup>			1.07	"	709.5
71.377	6s			"	"	823.3
57.363	6s			"	"	917.1
40.775	3b <sup>v</sup>			1.06	"	26029.1
34.861	6b <sup>v</sup>			"	"	069.3
29.920	3n			"	"	102.9
28.640	3			"	"	111.5
15.771	4s			1.05	7.4	199.6
11.55	3			"	"	228.6
01.09	1s			"	"	300.8
3794.153	4s			"	"	349.0
72.727	4b			1.04	7.5	498.5
70.410	2b			"	"	514.8
53.87	4b			"	"	631.7
40.66	5b			"	"	725.7
37.82	2b			1.03	"	746.1
35.91	1			"	"	759.7
25.54	1			"	7.6	834.1
14.45	4			"	"	914.3
3699.595	2			1.02	"	27022.4
84.84	3			"	"	130.6

## URANIUM.

Exner and Haschek, 'Sitzber. kais. Akad. Wissensch. Wien,' cvii., 1898.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo .
		$\lambda +$	$\frac{1}{\lambda} -$	
4699.95	1n	1.29	5.9	21270.9
99.3	1n	"	"	274
99.02	1n	"	"	275.1
97.55	1n	"	"	281.8
96.77	l	"	"	285.3
96.30	l	"	"	287.5
95.4	1b	"	"	292
93.95	1n	"	"	298.1
92.6	1b	1.28	"	304
92.32	1n	"	"	305.5
92.15	1n	"	"	306.3
91.45	1n	"	"	309.5
90.95	1n	"	"	311.7
90.1	1b	"	"	312
89.27	3	"	"	319.4
88.0	1n	"	"	322
87.1	1n	"	"	329
85.9	2n	"	"	335
84.87	1n	"	"	339.4
84.20	l	"	"	342.5
83.85	l	"	"	344.0
83.29	l	"	"	347.0
82.90	l	"	"	348.4
82.77	l	"	"	349.0
82.33	1n	"	"	351.0
81.40	1n	"	"	355.1
80.85	1n	"	"	358.6
80.4	1n	"	"	360
78.8	1b	"	"	367
78.1	1b	"	"	370
75.6	1n	"	"	382.5
74.45	1n	"	"	386.9
74.0	1n	"	"	389
71.66	2	"	"	399.7
69.55	l	"	"	409.4
69.22	l	"	"	411.0
69.05	l	"	"	411.7
68.67	l	"	"	413.5
67.45	l	"	"	419.1
67.07	2	"	"	420.8
66.23	l	"	"	424.7
65.42	l	"	"	428.4
64.98	l	"	"	430.4
64.30	l	"	"	433.5
63.97	l	"	"	435.1
63.2	1b	"	"	439
62.78	l	"	"	440.6
62.40	l	"	"	442.3
61.87	1n	"	"	444.7
61.0	1n	"	"	449
60.1	1n	"	"	453
59.52	1n	"	"	455.5
58.92	1n	"	"	458.2

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4658.4	1b	1.28	5.9	21461
57.6	1b	"	"	464
56.7	1n	"	"	468.5
55.40	1n	"	"	474.5
55.03	2	"	"	475.7
54.43	1n	1.27	"	478.9
53.65	1	"	"	482.6
53.25	1	"	"	484.4
53.05	1	"	"	485.4
52.09	1	"	"	489.7
51.75	1n	"	"	491.4
50.7	1n	"	"	496
50.24	1	"	"	498.2
49.37	2n	"	"	502.2
48.15	1	"	"	508.0
46.85	4	"	"	514.0
46.30	1	"	"	516.6
45.80	1n	"	"	518.9
45.13	1n	"	"	522.1
44.30	1	"	"	525.9
43.86	1	"	"	527.9
42.72	1n	"	"	533.2
41.91	2	"	"	536.9
40.57	1	"	"	543.0
39.3	1b	"	"	549.5
38.16	1n	"	"	554.7
35.73	1n	"	"	565.7
35.2	1n	"	"	568
34.2	1n	"	"	573
31.92	1	"	"	583.4
31.81	1	"	"	583.9
31.1	1b	"	"	587
30.4	1b	"	"	590
29.94	1	"	6.0	592.6
29.37	1n	"	"	595.2
28.5	1b	"	"	599
27.30	5	"	"	605.0
26.14	1	"	"	610.4
25.26	1n	"	"	614.5
24.91	1n	"	"	616.1
24.27	1n	"	"	619.1
23.68	1	"	"	620.8
22.23	1	"	"	627.5
22.13	1	"	"	628.0
20.42	3r	"	"	636.9
19.4	1n	"	"	642
18.60	2d	"	"	645.7
17.80	1n	"	"	649.3
17.33	1n	"	"	651.5
16.7	1n	1.26	"	654.5
15.85	1n	"	"	658.5
15.32	1n	"	"	661.0
15.18	1n	"	"	661.6
14.90	1	"	"	662.9
14.50	1n	"	"	664.6

## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4612.8	ln	1.26	6.0	21673
12.47	ln	"	"	674.3
11.70	2	"	"	678.0
10.07	2n	"	"	685.7
09.0	1b	"	"	691
06.4	ln	"	"	703
05.38	3	"	"	707.7
03.88	4	"	"	714.8
02.04	1	"	"	723.5
01.38	2	"	"	726.6
00.96	1	"	"	728.6
00.13	1	"	"	732.5
4599.73	ln	"	"	734.4
99.03	1	"	"	737.7
98.51	1	"	"	740.2
98.05	1	"	"	742.4
97.77	1	"	"	743.7
96.95	ln	"	"	747.6
95.91	ln	"	"	752.5
95.73	ln	"	"	753.3
95.30	1	"	"	755.4
94.49	1	"	"	759.3
92.75	ln	"	"	767.4
91.96	1	"	"	771.2
91.0	ln	"	"	776
90.46	ln	"	"	778.2
90.21	ln	"	"	779.4
89.55	ln	"	"	782.5
88.6	ln	"	"	787
88.1	ln	"	"	789.5
87.45	ln	"	"	792.5
87.1	ln	"	"	794
86.5	ln	"	"	797
85.75	ln	"	"	800.6
85.03	2	"	"	804.0
84.5	ln	"	"	807
83.52	1	"	"	811.2
83.00	1	"	"	813.8
82.65	ln	"	"	815.5
81.98	2	"	"	818.7
81.33	ln	"	"	821.7
81.02	ln	"	"	823.2
79.87	1	1.25	"	823.9
79.20	1	"	"	831.9
78.5	1b	"	"	835
77.40	1	"	"	840.5
76.85	1	"	"	843.1
76.25	ln	"	"	846.0
75.3	1b	"	"	850.5
75.00	1	"	"	851.9
74.6	ln	"	"	854
73.90	3d	"	"	857.2
73.50	1	"	"	859.1
73.2	ln	"	"	860.5
72.47	ln	"	"	864.0



URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4571·8	1n	1·25	6·0	21867
71·50	1	"	"	868·6
71·16	1	"	"	870·2
70·87	1	"	"	871·6
70·11	3	"	"	875·2
69·40	1	"	"	878·7
68·41	1	"	"	883·4
67·89	3	"	"	885·9
67·1	1b	"	"	890
65·8	1b	"	"	896
64·50	1n	"	6·1	902·1
64·26	1n	"	"	903·3
63·56	1n	"	"	906·7
62·10	1	"	"	913·6
61·6	1n	"	"	916
61·45	1n	"	"	916·7
60·50	1	"	"	921·8
60·0	1b	"	"	924
58·60	1	"	"	930·5
58·32	1	"	"	931·8
58·07	1	"	"	933·0
57·99	1	"	"	933·4
56·50	1	"	"	940·5
56·18	1	"	"	942·1
55·30	4	"	"	946·3
54·03	2	"	"	952·5
53·1	1n	"	"	957
52·63	1n	"	"	959·2
52·24	1n	"	"	961·1
51·87	1n	"	"	962·9
51·31	1n	"	"	965·6
50·68	1n	"	"	968·6
50·55	1n	"	"	969·2
50·05	2	"	"	971·7
49·4	1n	"	"	975
48·75	1n	"	"	977·9
48·4	1n	"	"	980
48·2	1n	"	"	980·5
47·65	1n	"	"	983·3
46·43	1	"	"	989·2
45·76	4	"	"	992·4
45·16	1	"	"	995·3
45·01	1	"	"	996·1
44·57	1	"	"	998·2
43·83	7	"	"	22001·8
43·21	1n	"	"	004·8
42·75	1n	1·24	"	007·0
42·25	1n	"	"	009·4
41·90	1	"	"	011·1
40·70	1	"	"	016·9
40·41	1	"	"	018·3
39·4	1n	"	"	023
38·37	4	"	"	028·2
37·35	1	"	"	033·2
37·0	1n	"	"	035

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
4536.80	1	1.24	6.1	22035.9
36.24	1	"	"	038.6
35.45	1n	"	"	042.4
35.32	1n	"	"	043.4
34.73	1n	"	"	045.9
33.91	1	"	"	049.9
33.25	1n	"	"	053.1
32.7	1b	"	"	056
31.95	1n	"	"	059.5
31.50	1n	"	"	061.6
30.93	1n	"	"	064.3
29.92	1	"	"	069.3
29.3	1b	"	"	072
28.74	1d	"	"	075.1
28.20	1	"	"	077.7
27.85	1	"	"	079.4
26.85	1	"	"	084.2
26.20	1n	"	"	087.4
25.98	1	"	"	088.6
25.87	1	"	"	089.1
25.57	1	"	"	090.6
25.14	1	"	"	092.7
24.3	1b	"	"	097
23.43	1	"	"	101.0
23.1	1b	"	"	103
21.81	2n	"	"	108.9
20.7	1n d	"	"	114
19.97	1n	"	"	117.9
19.4	1n	"	"	121
18.80	1n	"	"	123.6
18.30	1n	"	"	126.1
17.45	1	"	"	130.2
16.95	1	"	"	132.7
15.8	2b	"	"	138
15.50	4	"	"	139.8
14.49	1	"	"	144.8
14.30	1	"	"	145.7
13.89	1	"	"	147.7
13.55	1	"	"	149.3
13.04	1	"	"	151.8
12.62	1	"	"	154.0
12.37	1	"	"	155.2
11.98	1	"	"	157.1
11.88	1	"	"	157.6
11.46	1	"	"	159.6
10.53	3	"	"	164.2
10.08	1	"	"	166.4
09.55	1n	"	"	168.9
09.1	1b	"	"	171
08.4	1b	"	"	172
07.96	1	"	"	174.9
07.67	1	"	"	176.7
06.85	1n	"	"	881.8
06.42	2	"	"	184.5
06.31	2	"	"	185.0

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4504.95	1	1.23	6.1	22191.7
04.47	1n	"	"	193.1
03.97	1	"	"	196.5
03.86	1	"	"	197.0
02.56	1n	"	"	203.5
02.11	1	"	"	205.7
01.65	1n	"	"	208.0
00.9	1n	"	"	212
00.00	1n	"	"	216.1
4499.87	1n	"	"	216.7
99.40	1	"	"	219.1
98.47	1n d	"	"	223.7
97.7	1b	"	"	227.5
96.83	1n	"	"	231.8
96.35	1n	"	"	234.2
95.85	1n	"	"	236.6
95.5	1n	"	6.2	238
95.3	1n	"	"	239
94.90	1	"	"	241.2
94.09	1n	"	"	245.2
93.28	1	"	"	249.3
92.60	1	"	"	252.6
92.20	1	"	"	254.7
91.71	1	"	"	257.1
91.53	1	"	"	257.9
91.02	3	"	"	260.4
90.4	1b	"	"	263
89.29	1	"	"	269.9
89.1	1n	"	"	270
88.40	1	"	"	273.6
87.90	1n	"	"	276.0
87.27	1	"	"	279.2
87.15	1	"	"	280.0
86.52	1	"	"	282.9
86.12	1	"	"	284.8
85.40	1	"	"	288.3
84.7	1b	"	"	291
83.99	1	"	"	294.3
83.67	1	"	"	295.8
82.91	1	"	"	300.8
82.4	1b	"	"	303
81.25 *	1n	"	"	309.0
80.83	1n	"	"	311.0
80.55	1n	"	"	312.4
79.63	1n	"	"	316.7
79.15	1n	"	"	318.9
77.93	2	"	"	325.9
77.67	1n	"	"	327.1
76.70	1	"	"	331.7
75.91	1	"	"	335.8
75.50	1n	"	"	337.7
75.04	1n	"	"	339.8
74.73	1n	"	"	341.3

\* Mg?

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda -}$	
4474.5	ln	1.23	6.2	22342.5
74.4	ln	"	"	343
74.0	lb	"	"	345
73.6	lb	"	"	347
72.55	6	"	"	352.4
71.82	l	"	"	357.7
70.65	ln	"	"	363.3
70.50	l	"	"	362.6
70.0	ln	"	"	365
69.52	l	"	"	367.6
69.42	l	"	"	368.1
69.05	l	"	"	369.9
68.57	l	1.22	"	372.3
68.49	l	"	"	372.7
68.34	l	"	"	373.5
68.16	l	"	"	374.4
68.03	l	"	"	375.0
67.55	l	"	"	377.5
67.27	l	"	"	378.8
66.5	lb	"	"	383
65.92	l	"	"	385.7
65.35	3	"	"	388.5
64.50	l	"	"	392.7
64.38	l	"	"	393.3
63.98	l	"	"	395.4
63.19	3	"	"	399.7
62.99	l	"	"	400.8
62.59	l	"	"	402.3
62.45	l	"	"	403.0
62.04	l	"	"	405.1
61.62	l	"	"	407.2
61.13	l	"	"	409.7
60.77	l	"	"	411.5
59.97	ln	"	"	415.5
58.85	ln d	"	"	421.1
58.15	ln	"	"	424.6
58.03	l	"	"	425.2
57.67	l	"	"	427.0
57.33	l	"	"	428.7
57.0	ln	"	"	430
56.44	l	"	"	433.2
56.08	l	"	"	435.1
55.3	ln	"	"	439
54.1	ln	"	"	445
53.95	ln	"	"	445.7
53.68	l	"	"	447.1
53.46	l	"	"	448.2
52.48	l	"	"	453.1
52.19	l	"	"	454.6
51.72	l	"	"	456.9
51.18	ln	"	"	459.6
50.75	2	"	"	461.9
50.59	2	"	"	462.7
49.74	l	"	"	467.0
49.2	lb	"	"	470



## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda -}$	
4448.5	1b	1.22	6.2	22473
48.2	1b	"	"	475
47.30	2	"	"	479.2
46.18	1	"	"	484.8
45.70	1d	"	"	487.4
45.38	1	"	"	489.1
44.90	1	"	"	491.5
43.80	1	"	"	497.1
43.60	1	"	"	498.1
43.47	1	"	"	498.8
42.95	1n	"	"	501.4
42.80	1n	"	"	502.1
42.20	1n	"	"	505.2
41.75	1n	"	"	507.5
41.29	1	"	"	509.8
41.20	1	"	"	510.3
40.94	1	"	"	511.6
40.54	1	"	"	513.6
40.22	1n	"	"	515.3
39.32	1	"	"	519.8
38.90	1	"	"	521.9
38.61	1	"	"	523.3
38.42	1n	"	"	524.3
38.16	1n	"	"	525.7
37.12	1n	"	"	530.9
36.97	1	"	"	531.7
36.5	1n	"	"	534
35.72	1n	"	"	538.0
34.81	2	"	"	542.7
34.08	3	"	"	546.4
33.58	1n	"	"	548.9
33.35	1n	"	"	550.1
32.90	1	"	"	552.4
32.60	1	"	"	553.9
32.2	1b	"	"	556
31.8	1b	"	6.3	558
30.27	1	1.21	"	565.7
29.79	1	"	"	568.1
29.05	1	"	"	571.9
28.53	1	"	"	574.5
27.81	3	"	"	578.2
27.14	1	"	"	581.6
26.85	2	"	"	583.1
26.25	1	"	"	586.2
26.03	1	"	"	587.3
25.6*	1n	"	"	589.5
25.35	1n	"	"	590.8
24.73	1n	"	"	593.9
23.96	2	"	"	597.8
23.49	1	"	"	600.3
23.15	1	"	"	602.0
22.78	1	"	"	603.9
22.2	1n	"	"	607

\* Ca?

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
4420.89	2n	1.21	6.3	22613.6
20.57	1	"	"	615.2
19.8	1n	"	"	620
19.3	1n	"	"	620
18.68	1	"	"	624.9
18.22	1	"	"	627.2
17.94	1	"	"	628.7
17.61	1	"	"	630.3
17.00	1	"	"	633.5
16.73	1	"	"	634.9
16.05	1	"	"	638.3
15.46	2	"	"	641.4
14.97	1	"	"	643.9
14.85	1	"	"	644.5
14.50	1	"	"	646.3
13.33	1	"	"	652.3
13.07	1	"	"	653.7
12.7	1n	"	"	656
12.5	1n	"	"	657
12.0	1n	"	"	659
11.65	1	"	"	661.0
11.50	1	"	"	661.7
11.31	1	"	"	662.7
11.10	1	"	"	663.8
10.6	1n	"	"	666
10.3	1n	"	"	668
09.90	1	"	"	669.9
09.1	1n	"	"	674
08.92	1	"	"	675.0
08.73	1	"	"	676.0
08.15	1	"	"	679.0
07.4	1n	"	"	683
06.74	1	"	"	686.2
06.13	1	"	"	689.4
06.0	1n	"	"	690
05.47	1	"	"	692.7
05.09	1	"	"	694.7
04.99*	1	"	"	695.7
04.53	1	"	"	697.6
04.22	1	"	"	699.2
03.52	1	"	"	702.8
02.70	1	"	"	707.1
02.57	1	"	"	707.7
02.06	1	"	"	711.4
01.1	1n	"	"	715
00.65	1n	"	"	717.6
4399.81	1	"	"	721.8
98.0	1n	"	"	731
97.50	1	"	"	733.9
95.96	1n	"	"	741.8
95.45	1n	"	"	744.5
95.1	1n	"	"	746
94.83	1	1.20	"	747.7

\* Fe?

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4393.80	2	1.20	6.3	22753.0
92.73	1	"	"	758.6
92.40	1	"	"	760.3
92.04	1	"	"	762.1
91.69	1	"	"	763.9
91.46	1	"	"	765.1
91.30	1	"	"	766.0
91.1	1n	"	"	767
90.74	1	"	"	768.8
90.50	1	"	"	770.1
90.36	1	"	"	770.8
90.20	1	"	"	771.6
88.9	1n	"	"	778
88.4	1n	"	"	781
87.95	1n	"	"	783.3
87.8	1n	"	"	784
87.45	1n	"	"	785.9
86.9*	1n	"	"	789
86.35	1n	"	"	791.6
86.21	1n	"	"	792.4
85.76	1n	"	"	794.8
84.95	1	"	"	799.0
84.82	1	"	"	799.7
83.77	2	"	"	805.2
83.50	2	"	"	806.5
82.60	1	"	"	811.2
82.32	1	"	"	812.7
82.04	1	"	"	814.1
81.60	1	"	"	816.4
81.35	1	"	"	817.7
80.95	1	"	"	819.8
80.49	1	"	"	822.2
79.9	1n	"	"	825
79.41	1	"	"	827.9
78.75	1n	"	"	831.3
78.50	1n	"	"	832.6
78.0	1n	"	"	835
77.48	1n	"	"	837.9
77.00	1	"	"	840.4
76.37	1n	"	"	843.7
75.95	1	"	"	845.9
75.79	1n	"	"	846.7
74.22	1	"	"	854.9
73.61	2	"	"	858.1
72.95	1n	"	"	861.6
72.78	2	"	"	862.5
71.99	2	"	"	866.6
71.26	1	"	"	870.3
70.21	1	"	"	875.9
69.75	1n	"	"	878.3
69.5	1n	"	"	880
69.0	1n	"	"	882
68.42	1	"	6.4	885.2

\* Pb?

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
4368.33	1	1.20	6.4	22885.7
67.95	1	"	"	887.7
67.6	1n	"	"	889.5
65.77	1	"	"	899.2
65.28	1	"	"	901.7
65.18	1	"	"	902.3
65.00	1	"	"	903.1
64.61	1	"	"	905.2
64.50	1	"	"	905.7
64.03	1	"	"	908.1
63.15	2	"	"	912.8
63.00	1	"	"	913.6
62.48	3	"	"	916.3
62.23	2	"	"	917.6
61.36	1	"	"	922.2
61.2	1n	"	"	923
60.45	1n	"	"	927.1
59.92	1n	"	"	929.8
59.68	1n	"	"	931.1
59.10	1	"	"	934.2
58.83	1	"	"	935.6
58.60	1	"	"	936.8
58.36	1	"	"	938.0
58.0	1n	"	"	940
57.8	1n	"	"	941
57.06	1	"	"	944.9
56.75	1	1.19	"	946.5
55.89	4	"	"	951.1
54.77	2	"	"	957.0
54.53	2	"	"	958.3
54.25	1	"	"	959.7
53.95	1	"	"	961.4
53.3	1n	"	"	965
52.98	1	"	"	966.5
52.62	1	"	"	968.4
52.30	1	"	"	970.1
51.98	1	"	"	971.7
51.84	1	"	"	972.4
50.5	1n	"	"	979
50.3	1n	"	"	980
50.1	1n	"	"	982
49.8	1n	"	"	983
48.8	1n	"	"	988
4.32	1	"	"	989.6
47.36	3	"	"	996.1
46.95	1	"	"	998.2
46.48	1	"	"	23000.7
46.20	1	"	"	002.2
44.88	1	"	"	009.2
44.45	1	"	"	011.4
44.15	1	"	"	013.1
43.5	1n	"	"	016.5
42.60	1	"	"	021.3
41.89	4	"	"	025.0
40.86	1n	"	"	030.5



URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4340.63	1	1.19	6.4	23031.8
39.94	1	"	"	035.4
39.55	1	"	"	037.4
39.16	1d	"	"	039.5
38.93	1	"	"	040.7
38.80	1	"	"	041.4
38.48	1	"	"	043.1
38.1	1b	"	"	045
37.61	1	"	"	047.7
36.93	1n	"	"	051.3
36.60	2n	"	"	053.0
35.92	2n	"	"	056.8
35.44	1	"	"	059.3
35.13	1	"	"	060.9
34.66	1	"	"	063.4
33.71	1	"	"	068.5
33.15	1	"	"	071.5
32.47	1	"	"	075.1
32.05	1	"	"	077.4
31.63	1	"	"	079.6
30.9	1b	"	"	083.5
30.20	1n	"	"	087.2
29.7	1b	"	"	090
29.40	1	"	"	091.5
28.92	1	"	"	094.0
28.35	1	"	"	097.1
28.0	1b	"	"	099
27.18	2	"	"	103.4
26.06	3	"	"	109.3
25.32	1	"	"	113.2
24.90	1	"	"	115.5
24.75	1	"	"	116.3
23.92	2	"	6.5	120.8
22.55	1n	"	"	128.2
22.2	1b	"	"	120
21.51	1	"	"	133.8
21.2	1b	"	"	135
20.6	1b	"	"	138.5
19.97	2	"	"	141.8
19.67	1	"	"	143.4
19.22	1	"	"	145.9
18.5	1b	1.18	"	150
18.2	1b	"	"	151
17.78	1	"	"	153.6
17.46	1	"	"	155.4
17.27	1	"	"	156.4
16.70	1	"	"	159.4
16.20	1n	"	"	162.1
16.08	1n	"	"	162.7
15.7	1n	"	"	165
15.4	1n	"	"	166
14.08	2	"	"	173.4
13.39	2n	"	"	177.1
12.87	1	"	"	179.9
12.51	1	"	"	181.8

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4311.95	ln	1.18	6.5	23185.0
11.65	ln	"	"	186.6
11.3	lb	"	"	187
10.62	l	"	"	191.1
09.95	l	"	"	195.8
09.40	ln	"	"	198.7
08.8	lb	"	"	202
08.13	ln	"	"	205.5
07.50	l	"	"	208.8
07.06	l	"	"	211.1
06.99	l	"	"	211.5
06.71	l	"	"	213.0
06.48	l	"	"	214.3
06.1	ln	"	"	216
05.4	ln	"	"	220
04.9	ln	"	"	223
04.67	l	"	"	224.0
04.25	ln	"	"	226.3
03.53	l	"	"	230.3
03.43	l	"	"	230.8
03.00	l	"	"	233.1
02.60	l	"	"	235.2
02.51	l	"	"	235.7
02.30	l	"	"	236.8
01.9	ln	"	"	239
01.70	l	"	"	240.1
01.60	l	"	"	240.7
01.05	ln	"	"	243.7
00.95	ln	"	"	244.2
00.53	l	"	"	246.5
00.26	l	"	"	247.9
00.08	l	"	"	248.9
4299.61	2	"	"	251.4
99.26	ln	"	"	253.3
99.05	ln	"	"	254.3
98.6	ln	"	"	257
98.2	ln	"	"	260
97.78	l	"	"	261.4
97.31	3	"	"	263.9
96.77	l	"	"	266.8
96.49	l	"	"	268.3
95.93	l	"	"	271.3
95.47	l	"	"	273.8
95.32	l	"	"	274.6
94.85	l	"	"	277.2
94.40	ln	"	"	279.6
94.13	l	"	"	281.1
93.95	ln	"	"	282.1
93.53	l	"	"	284.4
92.87	ln	"	"	287.9
91.81	l	"	"	293.7
91.08	2	"	"	297.6
90.05	2	"	"	299.1
89.72	l	"	"	305.1
89.05	2	"	"	308.7

## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
4288.56	1	1.18	6.5	23311.4
88.05	3	"	"	314.2
87.10	3	"	"	319.3
86.5	1n	"	"	322.5
85.96	1	"	"	325.4
85.63	1	"	"	327.2
85.45	1	"	"	328.2
85.20	1	"	"	329.6
85.03	1	"	"	330.5
84.73	1	"	"	332.2
84.15	1n	"	"	335.3
83.65	1n	"	"	338.1
83.3	1n	"	"	340
82.67	3	"	"	343.5
82.25	3	"	"	345.8
82.00	1	"	"	347.1
81.5	1n	"	"	350
80.86	1n	1.17	"	354.7
80.4	1n	"	"	356
79.53	1n	"	"	360.6
78.37	2	"	"	367.0
77.76	1	"	"	370.3
77.43	1n	"	"	372.1
77.08	1	"	"	374.1
76.69	2	"	"	376.2
76.2	1n	"	"	379
75.94	1	"	"	380.1
75.46	1	"	"	382.8
75.2	1n	"	"	384
74.20	3	"	"	389.7
73.64	1	"	"	392.8
73.16	1n	"	"	395.4
72.52	1	"	"	398.9
72.03	1n	"	"	401.6
71.46	1	"	"	404.8
71.12	1	"	"	406.6
70.88	1	"	"	407.9
70.50	1d	"	"	410.0
69.84	4	"	"	413.6
69.05	2	"	"	418.0
68.67	1	"	"	420.1
68.22	1	"	"	422.5
68.12	1	"	"	423.0
67.76	1	"	"	425.0
67.50	2	"	"	426.4
66.89	1	"	"	429.8
66.53	1n	"	"	431.8
65.8	1n	"	"	436
65.45	1	"	"	437.7
64.95	1	"	"	440.5
64.49	1	"	"	443.1
64.05	1	"	"	445.4
63.97	1	"	"	445.8
63.66	1	"	"	447.5
63.38	1	"	"	449.0

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4263.12	1	1.17	6.5	23450.5
62.75	1	"	"	452.6
62.40	1n	"	"	454.5
61.73	1	"	"	458.2
61.25	1n	"	"	460.8
61.1	1n	"	"	462
59.65	1	"	"	469.6
59.43	2	"	"	470.8
59.10	1	"	"	472.6
58.7	1n	"	"	475
58.45	1n	"	"	476.2
58.3	1n	"	"	477
57.9	1n	"	"	479
57.21	1	"	"	483.1
56.75	1n	"	"	485.7
55.95	1	"	"	490.0
55.65	1	"	"	491.7
55.50	1	"	"	492.5
55.0	1n	"	"	495
54.6	1n	"	"	497
54.45	1n	"	"	498.3
54.10	1	"	"	500.2
53.9	1n	"	"	501
52.65	2	"	6.6	508.2
52.30	1n	"	"	510.2
51.9	1n	"	"	512
51.60	1n	"	"	514.1
51.1	1b	"	"	517
50.42	1n	"	"	520.5
50.2	1n	"	"	522
49.73	1	"	"	524.3
49.3	1b	"	"	527
48.8	1b	"	"	529
48.13	1	"	"	533.1
47.57	1	"	"	536.2
47.33	1	"	"	537.6
46.45	2	"	"	542.5
46.18	1	"	"	544.0
45.96	1	"	"	545.2
45.60	1	"	"	547.2
45.10	1	"	"	550.0
44.53	3	"	"	553.2
43.53	1	1.16	"	558.7
43.25	1	"	"	560.2
42.70	1	"	"	563.3
42.52	1	"	"	564.3
41.88	4	"	"	567.8
40.80	2	"	"	573.8
40.35	1n	"	"	576.3
39.9	1n	"	"	579
39.33	1	"	"	582.1
38.8	1b	"	"	585
37.93	1n	"	"	589.8
36.62	1	"	"	597.1
36.21	3	"	"	599.4



URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4235.60	1	1.16	6 6	23602.8
34.90	1	"	"	606.7
34.77	1	"	"	607.4
34.25	1	"	"	610.3
33.92	1	"	"	612.2
33.70	1	"	"	613.4
33.32	1	"	"	615.5
32.58	1	"	"	619.7
32.23	2	"	"	621.6
31.86	2	"	"	623.7
31.40	1n	"	"	626.2
30.5	1n	"	"	631
30.0	1n	"	"	634
29.9	1n	"	"	635
29.45	1	"	"	637.1
28.95	2	"	"	639.9
28.57	1	"	"	642.1
27.50	2	"	"	648.0
26.90*	2n	"	"	651.4
26.25	1	"	"	655.0
25.97	1	"	"	656.6
25.55	2n	"	"	659.0
24.5	1b	"	"	666
23.8	1n	"	"	669
23.50	1n	"	"	670.4
23.13	1	"	"	672.5
22.90	1	"	"	673.8
22.57	1	"	"	675.6
22.32	1	"	"	677.0
21.99	1	"	"	678.8
21.4	1n	"	"	682
20.87	1	"	"	685.2
20.30	1	"	"	688.4
20.20	1	"	"	689.0
19.89	1	"	"	690.7
19.70	1	"	"	691.7
19.5	1n	"	"	693
18.55	1n	"	"	698.2
18.3	1n	"	"	700
17.93	1	"	"	701.7
17.65	1	"	"	703.3
17.3	1n	"	"	704
17.0	1n	"	"	707
16.75	1	"	"	708.3
16.47	1	"	"	709.9
16.17	1	"	"	711.6
15.69	1	"	"	714.3
15.44	1	"	"	715.7
15.20	1	"	"	717.1
14.61	1	"	"	720.4
14.51	1	"	"	721.0
14.10	2	"	"	723.3
13.9	1n	"	"	724

## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4213.50	l	1.16	6.6	23726.6
13.19	l	"	"	728.3
12.94	l	"	"	729.7
12.67	l	"	"	731.3
12.47	2	"	"	732.4
12.35	l	"	"	733.1
11.87	2	"	"	735.8
11.52	l	"	"	737.7
11.05	ld	"	"	740.4
10.64	2	"	"	742.7
09.7	lb	"	"	748
07.4	lb	"	"	761
06.54	ld	"	"	765.8
06.14	l	"	"	768.2
05.2	ln	1.15	"	773.5
04.63	l	"	"	776.7
04.51	2	"	"	777.4
03.27	l	"	"	784.4
02.9	ln	"	"	786.5
02.60	ln	"	"	788.2
02.45	ln	"	"	789.0
01.80	ln	"	"	792.7
01.59	l	"	"	793.8
01.30	l	"	"	795.5
01.13	l	"	"	796.4
00.30	2	"	6.7	801.1
4199.8	ln	"	"	804
98.9	ln	"	"	809
98.39	l	"	"	812.0
97.69	2d?	"	"	816.0
97.35	ln	"	"	817.9
96.9	ln	"	"	820
96.70	l	"	"	821.5
96.0	ln	"	"	825.5
95.7	ln	"	"	827
95.4	ln	"	"	829
95.22	ln	"	"	829.9
94.55	l	"	"	833.7
94.15	ln	"	"	836.0
93.95	ln	"	"	837.2
93.60	ln	"	"	839.1
93.15	ln	"	"	841.6
92.35	ln	"	"	846.3
92.15	l	"	"	847.4
91.76	l	"	"	849.6
90.5	lb	"	"	857
89.40	2	"	"	863.1
89.0	ln	"	"	865
88.33	2	"	"	869.1
88.02	l	"	"	870.9
87.57	l	"	"	873.5
87.15	l	"	"	875.9
86.95	l	"	"	877.0
86.63	l	"	"	878.9
86.22	l	"	"	881.3

## URANIUM --continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuum
		$\lambda +$	$\frac{1}{\lambda} -$	
4185.97	1	1.15	6.7	23882.7
85.85	1	"	"	883.4
85.04	1	"	"	887.9
84.67	1n	"	"	890.0
84.27	1n	"	"	892.3
83.79	1	"	"	895.0
83.47	1	"	"	896.9
83.15	1	"	"	898.7
82.88	1	"	"	900.2
81.75	1	"	"	906.8
80.90	1	"	"	911.6
80.53	1n	"	"	913.7
80.3	1n	"	"	915
79.20	2	"	"	921.3
78.69	1	"	"	924.2
78.00	1	"	"	928.2
77.56	1	"	"	930.7
77.1	1n	"	"	933
76.75	1n	"	"	935.4
76.11	1	"	"	939.1
75.63	1	"	"	941.8
74.40	2	"	"	948.7
74.01	1	"	"	950.9
73.90	1	"	"	951.7
73.19	2	"	"	955.8
72.8	1n	"	"	958
72.40	1	"	"	960.3
71.80	3	"	"	963.8
71.00	1	"	"	968.4
70.60	1n	"	"	970.7
70.17	1	"	"	973.1
69.7	1n	"	"	976
69.25	1	"	"	978.4
68.3	1b	1.14	"	984
67.87	1n	"	"	986.4
67.25	1n	"	"	989.9
66.8	1n	"	"	992.5
65.87	2	"	"	997.9
65.35	1n	"	"	24000.9
64.97	1	"	"	003.1
64.6	1n	"	"	005
63.90	2	"	"	009.2
63.44	1	"	"	011.8
63.22	1	"	"	013.1
62.88	1	"	"	015.1
62.62	1	"	"	016.6
62.00	2	"	"	020.2
61.14	1	"	"	025.1
60.5	1b	"	"	029
60.05	1	"	"	031.5
59.59	1	"	"	034.2
59.30	1	"	"	035.9
59.15	1	"	"	036.8
58.8	1n	"	"	039
58.48	2	"	"	040.5

## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4156.81	2	1 14	6.7	24050.2
55.58	3	"	"	051.3
54.16	2	"	"	064.5
53.75	2	"	"	066.8
51.83	1	"	"	079.0
51.48	1	"	"	081.1
51.00	1	"	"	083.9
50.61	2	"	"	086.1
50.25	1n	"	"	088.2
49.57	1n	"	"	092.2
49.38	1n	"	"	093.3
48.97	1	"	"	095.7
48.76	1	"	"	096.9
48.33	1n	"	"	099.3
47.62	1	"	"	103.4
47.30	1	"	6.8	105.3
47.20	1	"	"	105.9
46.83	1	"	"	108.1
46.45	1	"	"	110.4
45.58	2	"	"	115.5
44.92	1	"	"	119.1
44.15	1n	"	"	123.6
43.76	1	"	"	125.9
43.19	1	"	"	129.2
42.59	1	"	"	133.2
42.42	1	"	"	133.7
42.32	1	"	"	134.3
42.09	1	"	"	135.6
41.45	3	"	"	139.3
40.80	1n	"	"	143.1
40.53	1n	"	"	144.7
39.34	2	"	"	151.7
38.84	1	"	"	154.6
38.15	1	"	"	158.6
37.00	1	"	"	165.3
36.68	1	"	"	167.2
36.32	1	"	"	169.3
35.97	1	"	"	171.3
35.39	1	"	"	174.7
35.03	1	"	"	176.8
34.23	1n	"	"	181.5
33.71	2	"	"	184.5
33.40	2	"	"	186.3
32.30	1	"	"	192.8
31.98	1	1.13	"	194.7
31.55	1	"	"	197.2
30.89	1	"	"	201.1
29.9	1n	"	"	207
29.65	1n	"	"	208.3
29.18	1	"	"	211.0
28.52	2	"	"	215.0
28.13	1	"	"	217.2
27.65	1d	"	"	220.1
27.05	1n	"	"	223.6
26.6	1b	"	"	226



## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4125.3	ln	1.13	6.8	24234
24.92	3	"	"	236.1
24.19	1	"	"	240.4
23.83	1	"	"	242.5
23.5	ln	"	"	244
23.3	ln	"	"	246
22.58	ln	"	"	249.9
22.39	ln	"	"	251.0
21.45	ln	"	"	256.5
21.0	ln	"	"	259
20.3	ln	"	"	263
19.90	ln	"	"	265.6
19.1	ln	"	"	270
18.59	2	"	"	273.4
17.75	ln	"	"	278.3
17.10	1	"	"	282.1
16.6	ln	"	"	285
16.30	3	"	"	286.9
15.10	1	"	"	293.9
14.82	1	"	"	295.6
14.42	1	"	"	298.0
14.18	1	"	"	299.3
14.10	1	"	"	299.9
13.77	1	"	"	301.8
13.27	1	"	"	304.8
12.95	1	"	"	306.6
12.70	1	"	"	308.1
11.8	1b	"	"	313
11.05	1	"	"	317.9
10.7	ln	"	"	320
10.20	1	"	"	322.9
08.9	ln	"	"	331
08.60	1	"	"	332.4
07.11	1	"	"	341.2
06.52	2	"	"	344.7
06.08	1	"	"	347.4
05.9	ln	"	"	348
05.48	ln	"	"	350.8
04.95	ln	"	"	354.0
04.58	ln	"	"	356.2
04.22	ln	"	"	358.3
03.73	1	"	"	361.3
03.29	1	"	"	363.9
02.98	1	"	"	367.0
02.41	1	"	"	369.0
02.10	1	"	"	371.0
01.5	ln	"	"	374.5
00.67	1	"	"	379.4
00.10	1	"	"	382.8
4099.45	ln	"	"	386.7
99.2	1b	"	6.9	388
98.30	1	"	"	393.4
98.20	1	"	"	394.1
97.9	ln	"	"	396
97.55	ln	"	"	397.9

## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4097.23	1	1.13	6.9	24399.7
96.93	1	"	"	401.5
96.83	1	"	"	402.2
96.56	1	"	"	403.9
95.90	1	"	"	407.8
95.8	1n	"	"	408
95.03	1	"	"	412.9
94.75	1	"	"	414.6
94.2	1b	"	"	418
93.80	1n	1.12	"	420.3
93.43	1n	"	"	422.5
92.97	1n	"	"	425.2
92.47	1n	"	"	428.1
92.05	1n	"	"	430.8
91.66	2d	"	"	432.2
90.28	4	"	"	440.3
88.98	1	"	"	449.1
88.40	2	"	"	452.5
87.87	1	"	"	455.6
87.51	1	"	"	457.7
86.92	1	"	"	461.2
86.83	1	"	"	461.8
86.63	1	"	"	463.4
86.28	1	"	"	465.4
85.1	2n	"	"	472
84.69	1	"	"	474.7
84.31	1	"	"	476.4
83.85	1n	"	"	479.6
83.15	1n	"	"	484.0
82.80	1	"	"	486.1
82.20	1	"	"	489.7
81.45	1	"	"	494.1
80.79	3	"	"	498.2
80.05	1n	"	"	502.6
79.51	1	"	"	505.8
79.00	1	"	"	508.9
78.35	1n	"	"	502.8
77.95	1	"	"	505.4
76.86	2	"	"	521.9
76.3	1b	"	"	525
75.83	1n	"	"	528.0
74.68	1d	"	"	534.9
73.93	1	"	"	539.4
73.80	1	"	"	540.2
73.3	1n	"	"	543
73.00	1	"	"	545.0
72.20	1	"	"	549.9
71.63	1	"	"	553.4
71.30	2	"	"	555.3
70.9	1n	"	"	558
70.6	1n	"	"	559.5
70.20	1	"	"	561.9
69.90	1	"	"	563.7
69.23	1	"	"	567.8
69.15	1	"	"	568.2

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
4068.75	1	1.12	6.9	24570.7
67.90	2	"	"	575.8
67.33	1	"	"	579.2
66.97	1	"	"	581.4
66.65	1	"	"	583.4
66.4	1n	"	"	585
66.2	1n	"	"	586
66.0	1n	"	"	587
64.32	2	"	"	597.4
63.78	1	"	"	600.7
63.26	1	"	"	603.8
62.72	2	"	"	607.2
61.90	1	"	"	612.1
61.51	1	"	"	614.5
61.10	1n	"	"	617.0
60.38	1	"	"	621.3
60.28	1	"	"	622.0
59.8	1b	"	"	625
59.3	1b	"	"	628
59.0	1b	"	"	630
58.35	2	"	"	633.4
58.05*	1n	"	"	635.5
57.5	1b	"	"	639
56.55	1	"	"	644.4
56.20	1	"	"	646.7
55.86	1	"	"	648.8
55.3	1b	"	"	652
54.99	1	1.11	"	654.1
54.87	1	"	"	654.8
54.46	1	"	"	657.3
53.8	1n	"	"	661
53.20	1	"	"	665.0
52.65	1n	"	"	668.3
52.2	1n	"	"	671
52.07	2	"	"	671.8
51.3	1n	"	7.0	676
51.1	1n	"	"	678
50.21	3	"	"	683.1
49.95	1	"	"	684.7
49.70	1	"	"	686.2
49.40	1n	"	"	688.0
48.70	1	"	"	692.3
48.25	1	"	"	695.0
47.78	1	"	"	697.9
47.26	1	"	"	701.2
46.2	1b	"	"	708
45.99†	2	"	"	708.8
45.40	1	"	"	712.4
45.10	1	"	"	714.3
44.63	2	"	"	717.1
44.2	1b	"	"	720
43.4	1b	"	"	725
42.96	1	"	"	727.4

\* Pb?

† Fe

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
4042.63	1	1.11	7.0	24729.4
42.15	1n	"	"	732.3
41.78	1n	"	"	734.6
41.23	1n	"	"	738.0
40.6	1n	"	"	742
39.9	1n	"	"	746
38.8	1b	"	"	753
38.36	1n	"	"	755.5
38.10	1	"	"	757.1
37.2	1b	"	"	763
36.75	2n	"	"	765.8
36.3	1n	"	"	768
35.8	1n	"	"	771
35.45	1n	"	"	773.4
34.67	1	"	"	778.2
34.50	1	"	"	779.2
34.15	1n	"	"	781.3
33.93	1	"	"	782.7
33.58	1	"	"	784.8
32.6	1b	"	"	791
32.00	1	"	"	794.6
31.50	1n	"	"	797.7
30.93	1	"	"	801.2
30.57	1	"	"	803.4
30.05	1n	"	"	806.6
29.90	1n	"	"	807.5
29.27	1n	"	"	811.4
28.55	1n	"	"	815.8
28.37	1	"	"	816.9
27.97	1	"	"	819.7
27.58	1	"	"	822.1
27.18	1	"	"	824.5
26.19	2	"	"	830.8
25.60	1	"	"	834.0
25.22	1	"	"	836.4
24.9	1n	"	"	838
24.45	1	"	"	841.1
24.33	1n	"	"	841.8
23.76	1n	"	"	845.4
23.40	1	"	"	847.6
23.05	1n	"	"	849.8
22.95	1n	"	"	850.4
22.2	1n	"	"	855
22.0	1n	"	"	856
21.65	1n	"	"	858.4
21.35	1n	"	"	860.3
21.17	1	"	"	861.4
20.35	1d	"	"	866.5
19.39	1	"	"	872.4
19.13	1	"	"	874.0
18.65	1	"	"	877.0
18.43	1	"	"	878.8
17.88	2	"	"	881.7
17.65	1	"	"	883.2
17.40	1	"	"	884.7



## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
4017.02	1d	1.11	7 0	24887.0
16.52	1	"	"	890.1
16.22	1	"	"	892.0
15.55	1	1.10	"	896.1
15.43	1	"	"	896.9
14.99	1	"	"	899.8
14.72	1	"	"	901.4
14.35	1	"	"	903.7
13.6	1n	"	"	908
13.30	1	"	"	910.1
12.93	1	"	"	912.4
12.60	1	"	"	914.5
12.38	1	"	"	915.9
12.03	1	"	"	918.0
11.93	1	"	"	918.7
11.64	1d	"	"	920.5
11.20	1	"	"	923.2
11.00	1	"	"	924.4
10.88	1	"	"	925.1
10.53	1	"	"	927.3
09.73	1	"	"	932.3
09.60	1	"	"	933.1
09.37	1	"	"	934.5
09.25	1	"	"	935.3
08.89	1	"	"	937.6
08.59	1	"	"	939.4
08.22	1n	"	"	941.7
08.10	1	"	"	942.5
07.86	1	"	"	944.0
07.60	1	"	"	943.6
07.28	1	"	"	945.6
07.13	1	"	"	946.6
06.5	1b	"	"	952
05.92	1	"	"	956.0
05.83	1	"	"	956.6
05.40	1	"	"	959.3
05.00	1	"	"	961.8
04.80	1	"	"	963.0
04.70	1	"	"	963.7
04.30	1	"	"	966.1
04.20	1	"	"	966.8
03.95	1	"	"	968.3
03.58	1	"	"	970.6
03.32	1	"	"	972.2
02.51	2	"	"	977.3
02.14	1	"	"	979.7
01.82	1	"	"	981.5
01.40	1	"	"	984.1
01.08	1	"	"	986.2
00.87	1	"	"	987.5
00.47	1	"	"	990.0
00.13	1	"	"	992.2
3999.70	1	"	"	994.8
99.33	1n	"	"	997.6
98.95	1n	"	"	999.7

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3998.36	2	1.10	7.0	24993.4
97.49	1	"	"	998.8
97.26	1	"	"	25000.2
96.90	1	"	"	012.3
96.1	1b	"	"	017.5
95.67	1	"	"	020.2
95.17	2	"	"	023.3
94.42	1	"	"	028.0
94.0	1n	"	"	030.5
93.2	1n	"	"	035.5
92.70	2	"	"	038.6
92.35	1n	"	"	040.8
91.9	1n	"	"	044
91.75	1n	"	"	044.6
90.61	1	"	"	051.7
90.24	1	"	"	054.0
90.10	1	"	"	055.5
89.47	1n	"	"	059.2
89.02	1	"	"	061.2
88.78	1	"	"	063.8
88.50	1	"	"	065.0
88.18	1	"	"	067.0
87.87	1	"	"	069.0
87.19	1	"	"	073.2
87.03	1	"	"	074.2
86.60	1n	"	"	076.9
85.95	2	"	"	081.0
85.19	1	"	"	085.8
84.90	1	"	"	087.6
84.70	1	"	"	088.9
84.33	1	"	"	091.2
84.03	1	"	"	093.1
83.45	1n	"	"	096.7
83.1	1n	"	"	099
82.69	1	"	"	092.6
82.27	1	"	"	095.1
81.93	1	"	"	097.3
81.71	1	"	"	098.7
81.06	1	"	"	111.8
80.95	1	"	"	112.5
79.92	1	"	7.1	119.0
79.67	1	"	"	120.6
79.27	1	"	"	123.1
78.95	1	"	"	125.1
78.4	1b	"	"	129
77.50	1	"	"	134.3
77.22	1	"	"	136.1
76.6	1b	"	"	140
75.4	1n	1.09	"	148
75.13	1	"	"	149.0
74.70	1n	"	"	152.0
74.50	1n	"	"	153.3
74.15	1	"	"	155.5
73.40	1	"	"	160.3
72.5	1	"	"	165.9

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3971.58	1	1.09	7.1	25171.8
71.3	1n	"	"	174
70.75	1	"	"	177.0
70.60	1	"	"	178.0
70.30	1	"	"	179.9
69.55	1	"	"	184.6
69.23	1	"	"	189.2
68.63	2Ca	"	"	190.5
68.16	1	"	"	193.5
67.8	1n	"	"	196
67.6	1n	"	"	197
67.25	1n	"	"	199.3
66.73	2	"	"	202.5
66.5	1n	"	"	204
66.10	1	"	"	206.6
66.00	1	"	"	207.2
65.43	1	"	"	210.8
65.15	1	"	"	212.6
64.85	1	"	"	214.5
64.32	1	"	"	217.9
63.13	1	"	"	225.6
62.95	1	"	"	226.7
62.60	1	"	"	228.9
62.43	1	"	"	230.0
62.18	1	"	"	231.6
61.88	1n	"	"	235.7
61.70	1n	"	"	234.6
61.29	1	"	"	237.2
61.00	1	"	"	239.0
60.70	1	"	"	241.0
60.4	1n	"	"	243
59.9	1b	"	"	246
59.5	1b	"	"	249
58.3	1b	"	"	256
57.97	1	"	"	258.4
57.65	1	"	"	260.4
57.50	1	"	"	261.4
57.08	1	"	"	264.1
56.72	1	"	"	266.3
56.45	1n	"	"	268.0
56.2	1n	"	7.2	270
55.91	1	"	"	271.5
55.55	1	"	"	273.7
54.87	2	"	"	278.1
54.40	1	"	"	281.1
53.75	1	"	"	285.2
53.13	1	"	"	285.9
52.67	1n	"	"	289.0
52.45	1	"	"	293.6
52.03	1n	"	"	296.2
51.75	1n	"	"	298.8
50.90	1	"	"	303.5
50.27	1	"	"	307.5
49.69	1	"	"	311.2
49.44	1	"	"	312.8

## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
3949.20	1	1.09	7.2	25314.4
48.54	1	"	"	318.5
48.13	1	"	"	321.2
47.05	1n	"	"	328.2
46.88	1	"	"	329.3
46.40	1	"	"	332.3
45.88	1n	"	"	335.1
45.45	1	"	"	338.5
45.10	1	"	"	340.8
44.77	1	"	"	342.9
44.32	2	"	"	345.8
43.97	1	"	"	348.1
43.68	1	"	"	350.0
43.00	1	"	"	354.2
42.71	1	"	"	356.1
42.43	1	"	"	357.9
42.22	1	"	"	359.2
41.60	1	"	"	363.2
41.26	1	"	"	365.4
40.80	1	"	"	367.4
40.64	1	"	"	368.4
40.45	1	"	"	369.6
39.93	1	"	"	378.0
39.56	1	"	"	380.4
39.27	1n	"	"	382.2
38.57	1n	"	"	382.7
38.00	1n	"	"	386.4
37.23	1	"	"	391.3
36.88	1	1.08	"	393.6
36.55	1d	"	"	395.7
36.18	1	"	"	398.1
35.52	2	"	"	402.4
34.9	1n	"	"	406
33.92	1	"	"	412.8
33.81	4Ca	"	"	413.5
33.18	1	"	"	417.6
32.20	3	"	"	424.0
31.65	1	"	"	427.6
31.37	1n	"	"	429.2
31.15	2	"	"	430.6
31.0	1n	"	"	432
30.58	1	"	"	434.3
30.22	1	"	"	436.6
29.90	1	"	"	438.7
29.38	1	"	"	442.1
29.22	1	"	"	443.2
28.95	1	"	"	444.9
28.60	1	"	"	447.2
28.45	1	"	"	448.5
28.20	1	"	"	449.8
27.92	1	"	"	451.6
27.10	1	"	"	456.9
26.90	1	"	"	458.1
26.45	1n	"	"	461.1
25.7	1n	"	"	466



URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3925.45	1n	1 08	7.2	25467.6
25.17	1n	"	"	469.4
25.0	1n	"	"	470.5
24.67	1	"	"	472.7
24.45	1	"	"	474.1
24.11	1	"	"	476.3
23.8	1n	"	"	478
23.5	1n	"	"	480
23.25	1	"	"	481.8
22.60	1	"	"	486.1
22.35	1	"	"	487.7
22.18	1	"	"	488.8
21.74	1	"	"	491.7
21.40	1	"	"	493.9
21.2	1n	"	"	495
20.07	1n	"	"	498.4
20.05	1n	"	"	499.7
19.95	1n	"	"	503.3
19.49	1	"	"	506.3
19.22	1	"	"	508.0
18.57	1	"	"	512.3
18.27	1	"	"	514.3
17.96	1	"	"	516.3
17.78	1	"	"	517.5
17.55	1	"	"	518.9
17.45	1	"	"	519.6
17.18	1	"	"	521.4
16.75	1n	"	"	524.2
16.60	1n	"	"	525.1
16.05	2	"	"	528.8
15.5	1n	"	"	532
15.20	1	"	"	534.3
14.94	1	"	"	536.0
14.45	3	"	"	539.2
14.0	1n	"	"	542
13.63	1	"	"	544.5
13.48	1	"	"	545.5
12.95	1n	"	"	549.0
12.60	1	"	7.3	551.1
11.90	1	"	"	555.7
11.45	1n	"	"	558.8
11.15	1n	"	"	560.7
10.67	1	"	"	563.9
10.37	1	"	"	566.8
09.88	1	"	"	568.9
09.22	1	"	"	573.2
09.10	1	"	"	574.0
08.60	1n	"	"	577.3
08.01	1	"	"	581.2
07.72	1	"	"	583.1
07.42	1	"	"	585.1
07.17	1	"	"	586.8
06.7	2b	"	"	590
06.1	1b	"	"	594
05.00	1	"	"	600.9

## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuum
		$\lambda +$	$\frac{1}{\lambda} -$	
3904.73	1	1.08	7.3	25602.8
04.44	1	"	"	604.6
04.06	1	"	"	607.2
03.47	1	"	"	611.0
03.13	1	"	"	613.2
02.70	1	"	"	618.6
01.75	1n	"	"	622.3
00.48	1	"	"	630.6
3899.98	2	"	"	633.9
99.64	1	"	"	636.1
99.24	1n	"	"	638.7
98.97	1n	"	"	640.5
98.1	1n	"	"	646
97.87	1	"	"	648.7
97.44	1	"	"	650.6
97.22	1	"	"	652.0
96.92	2	1.07	"	654.0
96.27	1	"	"	658.3
96.07	1	"	"	659.6
95.82*	1	"	"	661.2
95.41	1	"	"	663.9
95.20	1	"	"	665.3
94.89	1	"	"	667.4
94.26	1	"	"	671.5
93.96	1	"	"	673.5
93.48	1	"	"	676.7
92.85	2	"	"	680.8
92.56	1	"	"	682.7
92.22*	1	"	"	685.0
91.93	1	"	"	686.9
91.22	1	"	"	691.6
90.51	3	"	"	696.3
89.54	1	"	"	702.7
88.72	1	"	"	708.1
88.32	1	"	"	710.8
87.85	1	"	"	713.8
87.36	1	"	"	717.2
86.6	1b	"	"	722
85.83	1	"	"	727.3
85.12	1	"	"	731.9
84.83	2	"	"	733.8
84.47	1	"	"	736.2
84.09	1	"	"	738.7
83.4	1n	"	"	743
83.20	1	"	"	744.6
82.79	1	"	"	746.8
82.52	1	"	"	747.8
82.05	1	"	"	750.9
81.61	2	"	"	755.6
80.8	1n	"	"	761
79.88	1	"	"	766.9
79.73	1	"	"	767.9
79.12	1	"	"	761.9

\* Mg?

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3878.23	2	1.07	7.3	25777.7
77.60	ln	"	"	781.9
77.50	ln	"	"	782.5
77.1	ln	"	"	785
76.75	1	"	"	787.4
76.48	1	"	"	784.2
76.28	1	"	"	790.5
75.66	1	"	"	794.8
75.15	ln	"	"	798.1
74.68	1	"	"	801.3
74.20	2	"	"	804.5
73.28	1	"	"	810.5
73.22	1	"	"	811.0
73.03	1	"	"	812.2
72.70	1	"	"	814.4
72.50	1	"	"	815.8
72.06	1	"	"	818.8
71.69	1	"	"	821.3
71.52	1	"	"	822.4
71.18	1	"	"	824.6
70.73	1	"	"	827.7
70.22	1	"	"	831.0
69.90	1	"	"	833.2
69.05	1	"	"	838.8
68.95	1	"	"	839.5
68.57	1	"	"	842.0
67.32	1	"	"	851.2
67.17	1	"	"	852.1
66.89	1	"	"	853.9
66.62	1	"	"	855.7
66.08	2	"	"	859.3
65.65	1 (Fe)	"	"	862.2
65.26	1	"	"	864.7
64.85	ln	"	"	866.9
64.65	1	"	"	868.4
64.48	1	"	"	869.5
64.24	1	"	"	871.1
63.90	1	"	"	873.3
63.57	1	"	"	875.5
63.25	ln	"	"	877.6
62.45	ln	"	"	882.9
61.9	ln	"	"	887
61.30	1	"	"	890.8
60.75	ln	"	"	894.4
59.75	3	"	"	901.1
59.16	1	"	"	905.0
58.8	ln	"	"	907.5
58.35	ln	"	"	911.2
57.8	ln	"	"	914
57.35	ln	"	"	917.2
56.94	1	1.06	"	919.9
56.74	1	"	"	921.3
56.5	ln (Fe)	"	"	923
55.96	1	"	"	926.5
55.60	1	"	"	929.0

## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3855.00	1	1.06	7.3	25933.0
54.80	2	"	"	934.4
54.42*	1	"	"	937.0
53.95	1	"	"	940.1
53.53	1d	"	"	942.9
53.16	1	"	"	945.5
52.86	1n	"	"	947.4
52.28	1n	"	"	951.3
52.0	1n	"	"	953
51.45	1	"	"	956.9
51.10	1	"	"	959.3
50.95	1n	"	"	960.3
50.5	1	"	"	963
49.87	1	"	"	967.6
49.6*	1n	"	"	969
48.9	1n	"	"	974
48.77	1	"	"	975.6
48.24	1	"	"	978.6
47.95	1n	"	"	980.6
47.25	1n	"	"	985.3
46.70	1	"	"	989.0
46.38	1	"	"	991.2
45.98	1	"	"	993.9
45.50	2	"	"	997.1
45.27	1	"	"	998.6
44.85	1	"	"	991.5
44.33	1n	"	"	995.0
44.13	1	"	"	996.4
43.92	1	"	"	997.8
43.61	1	"	"	999.9
42.86	1	"	"	26015.0
42.36	1	"	"	018.4
42.00	1	"	"	020.8
41.20	1d (Fe)	"	"	026.2
40.50	1	"	"	031.0
40.05	1	"	"	034.0
39.77	1	"	"	035.9
39.63	1	"	"	036.9
39.15	2	"	"	040.2
38.28	2	"	"	046.1
37.95	1	"	"	048.3
37.63	1	"	"	050.4
37.40	1	"	"	052.0
37.0	1n	"	"	055
36.6	1n	"	"	057
36.45	1n	"	"	058.3
36.05	1	"	"	061.2
35.25	1	"	"	066.6
34.94	1	"	"	068.7
34.72	1	"	"	070.2
33.90	1	"	"	075.8
33.16	1	"	"	080.8
32.75	1	"	"	083.6

\* Mg ?



## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3832.07	1	1.06	7.3	26088.2
31.60	3	"	"	091.4
30.77	1	"	"	097.0
30.36	1	"	"	099.8
29.95	1	"	"	102.7
29.50*	1	"	"	105.8
29.20	1	"	"	107.8
28.92	1	"	"	109.3
28.22	1	"	"	114.5
27.93*	1	"	"	116.5
27.56	1	"	"	119.0
27.02	1	"	"	122.7
26.65	2	"	"	125.2
25.61	1	"	"	132.3
25.29	1	"	"	134.5
24.85	1	"	"	137.5
24.1	1n	"	"	143
23.62	1	"	"	146.0
23.26	1	"	"	148.4
23.10	1	"	"	149.5
22.71	1	"	"	152.2
22.56	1	"	"	153.2
22.14	1	"	"	156.1
21.38	1	"	"	161.2
21.15	1	"	"	162.8
19.46	1	"	"	174.4
19.19	1	"	"	176.3
18.86	1d	"	"	178.5
18.62	1	"	"	180.1
18.28	1	"	"	182.5
17.80	1	"	"	185.7
17.30	1	"	7.4	189.1
16.75	1	1.05	"	192.9
16.22	1	"	"	196.5
15.50	1	"	"	201.5
15.30	1	"	"	202.9
14.96	1	"	"	205.2
14.25	2	"	"	210.1
13.94	2	"	"	212.2
13.40	1	"	"	215.9
12.86	1	"	"	219.6
12.72	1	"	"	220.6
12.42	1	"	"	222.7
12.16	1	"	"	224.4
11.81	1	"	"	226.8
11.67	1	"	"	227.8
11.20	1	"	"	231.1
11.05	1	"	"	232.1
10.33	1	"	"	237.0
09.73	1n	"	"	241.2
09.36	1	"	"	243.7
09.12	1	"	"	245.4
08.35	1n	"	"	250.7

\* Mg?

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
3807.75	l	1.05	7.4	26254.8
07.4	lb	"	"	257
06.5	ln	"	"	263
06.40	l	"	"	264.1
05.99	l	"	"	267.0
05.83	l	"	"	275.0
05.20	ln	"	"	272.4
05.00	l	"	"	273.8
04.52	ln	"	"	277.1
04.1	lb	"	"	280
03.50	l	"	"	284.2
03.25	l	"	"	285.9
03.00	l	"	"	287.6
02.43	l	"	"	291.6
02.10	l	"	"	293.9
01.90	ln	"	"	295.2
01.45	l	"	"	298.4
01.35	l	"	"	299.0
00.9	ln	"	"	303
00.43	ln	"	"	305.4
00.30	ln	"	"	306.3
3799.75	l	"	"	310.1
99.36	l	"	"	312.8
98.99	l	"	"	324.9
98.40	l	"	"	319.4
97.93	ld	"	"	322.8
97.70	l	"	"	324.3
97.2	lb	"	"	328
96.98	l	"	"	329.4
96.70	l	"	"	331.3
96.62	l	"	"	331.8
96.38	l	"	"	333.5
96.20	l	"	"	334.7
95.76	l	"	"	337.8
95.29	l	"	"	341.1
94.50	l	"	"	346.5
94.15	l	"	"	349.0
93.74	l	"	"	351.8
93.45	l	"	"	353.8
93.24	2	"	"	355.2
92.69	l	"	"	359.1
92.50	ld	"	"	360.4
92.03	l	"	"	363.7
91.50	l	"	"	367.4
91.25	l	"	"	369.1
90.94	l	"	"	371.3
90.50	l	"	"	374.3
90.36	l	"	"	375.3
90.03	l	"	"	377.6
89.76	l	"	"	379.5
89.36	l	"	"	382.2
89.02	l	"	"	384.5
88.77	l	"	"	386.3
88.37	l	"	"	389.1
88.15	l	"	"	390.6

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3787.40	1	1.05	7.4	26395.9
86.99	1	"	"	398.8
86.74	1	"	"	400.5
86.30	1n	"	"	403.6
85.5	1n	"	"	409
85.30	1	"	"	410.6
84.90	1	"	"	413.4
84.02	1	"	"	419.5
83.80	1n	"	"	421.1
82.99	2	"	"	426.7
82.5	1b	"	"	430
82.1	1b	"	"	433
81.60	1	"	"	436.4
81.33	1	"	"	438.3
81.23	1	"	"	443.6
80.90	2	"	"	441.3
80.44	1	"	"	444.5
79.3	1n	"	"	453
79.18	1	"	"	453.4
78.75	1n	"	"	456.4
78.5	1n	"	"	459
78.15	1	"	"	460.6
77.83	1	"	"	462.9
77.61	1	"	"	464.5
77.50	1n	"	"	465.1
77.17	1	"	"	467.2
76.87	1	1.04	"	469.3
76.63	1	"	"	471.0
76.15	1	"	"	474.3
75.74	1	"	"	476.9
75.65	1	"	"	477.9
75.42	1	"	"	479.5
75.02	1	"	"	482.3
74.57	1	"	"	485.5
74.22	1	"	"	488.0
73.82	1	"	"	491.0
73.72	1	"	"	493.7
73.57	1	"	"	492.7
72.97	2	"	"	496.9
72.50	1	"	7.5	500.1
71.55	1	"	"	506.8
70.60	1	"	"	513.5
70.30	1	"	"	515.6
69.68	2	"	"	519.8
68.95	1	"	"	525.0
68.67	1	"	"	527.0
68.57	1	"	"	527.8
68.22	1n	"	"	530.1
68.02	1n	"	"	531.5
67.62	1	"	"	534.3
67.33*	1	"	"	536.4
67.05	1	"	"	538.5
66.6	1b	"	"	542

\* Fe?

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
3766.00	1	1.04	7.5	26545.9
65.47	1n	"	"	549.6
64.95	1n	"	"	553.2
64.71	1	"	"	555.0
64.30	1	"	"	557.9
64.00	1	"	"	560.0
63.43	1	"	"	564.0
63.13	1	"	"	566.1
62.89	1	"	"	567.8
62.27	1	"	"	572.2
62.11	1	"	"	573.3
61.74	1	"	"	575.9
61.23	1	"	"	579.5
61.02	1	"	"	581.1
60.5	1n	"	"	585
60.00	1	"	"	588.2
59.38	2	"	"	592.6
58.2	1n	"	"	601
57.09	1	"	"	608.9
56.82	1n	"	"	610.8
55.7	1b	"	"	618
55.2	1b	"	"	622
54.46	1	"	"	627.5
54.12	1	"	"	629.8
53.85	1n	"	"	631.9
53.7	1n	"	"	633
53.22	1	"	"	636.2
53.02	1	"	"	637.7
52.84	1	"	"	639.0
52.49	1	"	"	644.4
52.30	1	"	"	642.9
51.92	1	"	"	645.6
51.46	1	"	"	648.8
51.3	1n	"	"	650
50.51	1	"	"	655.5
50.14	1	"	"	658.2
50.02	1	"	"	659.0
49.35	1	"	"	663.8
48.90	2	"	"	667.0
47.34	2	"	"	668.7
46.82	1n	"	"	678.2
46.60	2	"	"	683.3
46.10	1n	"	"	686.9
45.75	1	"	"	689.3
45.53	1	"	"	690.8
45.15	1	"	"	693.7
44.95	1	"	"	695.1
44.65	1	"	"	697.2
44.39	1	"	"	699.0
43.97	1d	"	"	702.1
43.55	1	"	"	704.9
43.07	1n	"	"	708.6
42.96	1	"	"	709.3
42.67	1n	"	"	711.5
42.50	1	"	"	712.6



## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
3741·87	1	1·04	7·5	26717·0
41·56	1	"	"	719·3
41·43	1	"	"	720·2
41·12	1	"	"	722·4
40·85	1n	"	"	724·3
40·4	1b	"	"	728
39·50	1	"	"	734·0
39·18	1	"	"	735·3
38·80	1	"	"	738·0
38·48	1	"	"	740·2
38·23	2	"	"	742·0
37·45	2n	1·03	"	747·5
36·75	1n	"	"	753·7
36·2	1n	"	"	758
35·7	1n	"	"	761
35·05*	1	"	"	766·6
34·83	1	"	"	767·4
33·95	1	"	"	773·7
33·75	1	"	"	775·2
33·25	2	"	"	778·7
32·77	2	"	"	782·2
32·43	1	"	"	784·6
31·9	1n	"	"	788·5
31·64	1	"	"	790·4
31·10	1	"	"	794·3
30·98	1	"	"	795·1
30·37	1	"	"	799·5
30·00	2	"	"	802·1
29·49	1	"	"	805·6
29·00	1	"	"	809·3
28·60	1	"	"	812·2
28·01	1	"	7·6	816·5
27·91	1	"	"	817·1
27·30	1	"	"	821·5
27·02	1	"	"	823·5
26·72	1	"	"	828·7
26·49	1	"	"	827·3
26·22	1	"	"	829·2
25·93	1n	"	"	831·3
25·80	1	"	"	832·2
25·55	1	"	"	834·0
25·26	1	"	"	836·1
25·18	1	"	"	836·6
24·50	1	"	"	841·6
24·35	1	"	"	842·5
23·85	2n	"	"	846·2
22·92	1	"	"	853·0
22·6	1n	"	"	855
21·95	1n	"	"	866·0
21·55	1n	"	"	862·9
20·54	1	"	"	870·1
20·13*	1	"	"	873·2
19·75	1	"	"	875·9

\* Fe?

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3719.50	1	1.03	7.6	26877.7
18.98	1n	"	"	881.5
18.78	1	"	"	882.9
18.25	2	"	"	886.8
17.60	1	"	"	891.5
17.23	1	"	"	893.2
16.95	1	"	"	895.2
16.72	1	"	"	896.9
16.32	1	"	"	899.8
15.85	1	"	"	904.1
15.63	1	"	"	905.7
15.15	1	"	"	909.2
14.93	1	"	"	910.8
14.60	1	"	"	913.2
14.40	1	"	"	914.6
13.95	1	"	"	917.9
13.82	1	"	"	918.7
12.4	1b	"	"	929
11.98	1	"	"	932.2
11.10	1	"	"	938.6
11.00	1	"	"	939.3
10.73	1	"	"	941.2
10.36	1	"	"	948.4
10.05	1	"	"	946.2
09.65	1n	"	"	949.1
09.45	1n	"	"	950.5
09.2	1n	"	"	952
08.75	1n	"	"	955.7
08.10	1	"	"	960.4
07.80	1	"	"	962.5
07.45	1n	"	"	965.0
06.86	1	"	"	969.4
06.10	2	"	"	974.9
05.72	2	"	"	977.7
05.20	1	"	"	981.5
04.50	1	"	"	986.6
04.25	1	"	"	988.4
03.80	1	"	"	991.7
03.45	1	"	"	994.2
02.80	1	"	"	999.0
02.38	1n	"	"	27002.1
01.9	1n	"	"	006
01.68	2	"	"	007.3
00.74	1	"	"	014.1
00.00	1	"	"	019.4
3699.83	1	"	"	020.6
99.60	1	"	"	022.3
98.63	1d	"	"	029.4
98.10	1	"	"	033.3
97.69	1	1.02	"	036.4
97.32	1	"	"	039.1
96.98	1	"	"	041.5
96.48	1	"	"	045.2
96.25	1	"	"	046.9
95.98	1	"	"	048.8

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
3695.35	1n	1.02	7.6	27053.4
94.95	1n	"	"	056.3
94.46	1	"	"	060.0
93.89	2	"	"	064.1
93.46	1	"	"	067.3
93.08	1n	"	"	070.1
92.48	1	"	"	074.4
92.15	1	"	"	079.6
92.07	1	"	"	077.5
91.65	1n	"	"	080.5
91.15	1n	"	"	081.6
91.00	1n	"	"	085.3
90.43	1	"	"	084.2
90.18	1	"	"	091.3
89.80	1	"	"	094.1
89.37	1	"	"	097.2
89.19	1	"	"	098.6
88.93	1	"	"	100.5
88.53	1	"	"	103.5
88.02	1	"	"	107.2
87.88	1	"	"	108.2
87.55	1	"	"	110.6
87.27	1	"	"	112.7
87.12	1	"	"	113.8
86.93	1	"	"	115.7
86.63	1	"	"	117.4
85.94	1	"	"	122.5
85.71	1	"	"	124.2
85.45	1	"	"	126.1
84.77	1n	"	"	131.1
84.45	1	"	"	133.4
84.30	1	"	"	134.6
83.75	1	"	7.7	138.6
83.00	1	"	"	144.1
82.63	1	"	"	146.8
82.25	2	"	"	149.6
81.85	1	"	"	152.6
81.07	1d	"	"	158.3
80.68	1	"	"	161.2
80.45	1	"	"	162.9
80.10	1	"	"	165.5
79.99	1	"	"	166.3
79.54	1	"	"	169.6
78.93	2	"	"	174.1
78.3	1n	"	"	179
77.82	1	"	"	182.3
77.60	1	"	"	184.0
77.2	1n	"	"	187
76.75	2d	"	"	190.2
75.75	1d	"	"	197.6
75.26	1	"	"	201.3
75.19	1	"	"	201.8
74.90	1	"	"	203.9
74.25	1	"	"	208.7
73.56	1	"	"	213.8

## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3673.22	1	1.02	7.7	27216.3
72.75	2	"	"	219.8
71.98	1n	"	"	225.5
71.75*	1n	"	"	227.2
70.7	1n	"	"	235
70.40	1	"	"	237.3
70.26	3	"	"	238.3
69.50	1	"	"	244.0
69.33	1	"	"	245.2
68.90	1	"	"	248.4
68.25	1n	"	"	253.2
68.13	1	"	"	254.1
67.9	1n	"	"	256
67.30	1	"	"	260.3
66.95	1d	"	"	206.3
66.35	1	"	"	207.5
66.28	1	"	"	268.0
65.6	1n	"	"	273
65.3	1n	"	"	275
64.92	1	"	"	278.0
64.69	1	"	"	279.7
64.40	1	"	"	283.9
64.0	1n	"	"	285
63.5	1n	"	"	289
63.2	1n	"	"	291
62.8	1n	"	"	294
62.50	1	"	"	296.1
62.10	1	"	"	299.0
61.60	1	"	"	302.8
61.47	1	"	"	304.4
60.90	1n	"	"	308.0
60.5	1n	"	"	311
60.27	1	"	"	313.3
59.76	1	"	"	317.1
59.28	1	"	"	320.7
59.19	1	"	"	321.3
58.8	1n	"	"	324
58.30	1	"	"	327.4
58.01	1	"	"	329.6
57.50	2	1.01	"	333.3
57.09	1	"	"	336.4
56.80	1	"	"	338.6
56.40	1	"	"	341.6
56.30	1	"	"	342.4
56.09	1	"	"	344.0
55.61	1	"	"	347.5
55.35	1	"	"	349.5
55.05	1	"	"	351.7
54.80	1	"	"	353.6
54.43	1	"	"	356.3
54.25	1	"	"	357.7
53.65	1	"	"	362.2
53.34	1	"	"	364.5

\* Pb?



URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3652.21	1	1.01	7.7	27373.0
51.6	1b	"	"	378
50.8	1b	"	"	384
50.55	1n	"	"	385.4
50.16	1	"	"	388.4
49.83	1	"	"	390.8
49.53	1	"	"	393.1
49.02	1	"	"	396.9
48.65	1	"	"	399.7
48.27	1	"	"	402.6
47.9	1n	"	"	405
47.7	1n	"	"	407
47.00	1	"	"	412.1
46.63	1	"	"	414.9
46.13	1	"	"	418.6
45.82	1	"	"	421.0
45.60	1	"	"	422.6
45.19	1	"	"	425.7
44.93	1	"	"	427.7
44.38	1	"	"	431.8
43.75	1	"	"	436.6
43.2	1b	"	"	441
42.95	1	"	"	442.6
42.59	1	"	"	445.3
42.20	1	"	"	448.2
41.37	1	"	"	454.5
41.09	1	"	"	456.6
40.84	2	"	"	458.5
40.17	1	"	"	463.5
39.75*	1n	"	"	466.7
39.31	1	"	7.8	469.9
38.79	1	"	"	473.9
38.33	1	"	"	477.3
38.03	1	"	"	479.6
37.63	1	"	"	482.6
36.7	1b	"	"	490
36.3	1b	"	"	493
35.74	1n	"	"	496.9
35.45	1	"	"	499.1
35.17	1	"	"	501.2
34.70	1	"	"	504.8
34.40	1n	"	"	507.1
33.42	2	"	"	514.5
33.05	1	"	"	517.3
32.9	1n	"	"	518
32.33	1	"	"	522.7
32.0	1n	"	"	525
30.84	3	"	"	534.0
30.40	1	"	"	537.4
30.17	1	"	"	539.1
29.70	1	"	"	542.7
29.25	1	"	"	546.1
28.96	1	"	"	548.3

## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
3628.51	1	1.01	7.8	27551.7
28.23	1	"	"	553.9
27.86	1	"	"	556.7
27.60	1	"	"	558.6
27.2	1n	"	"	562
26.95	1n	"	"	563.6
26.60	2r	"	"	566.2
25.65	1	"	"	573.5
25.25	1	"	"	576.5
25.00	1	"	"	578.4
24.75	1	"	"	580.3
24.42	1	"	"	582.8
24.00	1n	"	"	586.0
23.6	1n	"	"	589
23.21	2	"	"	592.0
22.83	1	"	"	594.9
22.45	1	"	"	597.8
22.25	1	"	"	599.4
22.00	1	"	"	601.3
21.72	1	"	"	603.4
21.65	1	"	"	603.9
21.20	1	"	"	607.3
21.03	1	"	"	608.7
20.68	1	"	"	611.3
20.31	2	"	"	614.1
19.95	1	"	"	616.9
19.56	1	"	"	619.9
19.32	1	"	"	621.7
18.94*	1	"	"	624.6
18.65	2	"	"	626.8
18.2	1b	"	"	630
17.72	1d	1.00	"	633.9
17.28	1	"	"	637.3
16.90	2	"	"	640.2
16.49	1	"	"	643.3
15.98	1	"	"	647.2
15.6	1n	"	"	650
15.42	1	"	"	651.5
15.15	1	"	"	653.6
14.85	1	"	"	655.9
14.4	1n	"	"	659
14.16	1n	"	"	661.1
13.95	1	"	"	662.8
13.55	1n	"	"	665.8
13.30	1	"	"	667.7
12.88	1	"	"	670.9
12.7	1	"	"	672
12.05	1	"	"	677.3
11.85	1	"	"	678.8
11.44	1	"	"	682.0
11.20	1	"	"	683.8
10.87	2	"	"	686.4
10.65	2	"	"	688.0

\* Fe?

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3609.86	2	1.00	7 8	27694.1
09.53	1	"	"	696.6
09.13	1	"	"	699.7
08.84	1	"	"	701.9
08.55	1	"	"	704.2
08.20	1	"	"	706.9
07.97	1	"	"	708.6
07.18	1n	"	"	713.9
07.52	1	"	"	712.0
07.15	1	"	"	714.9
06.51	2	"	"	719.8
06.26	1	"	"	721.8
06.00	1	"	"	723.8
05.90	1	"	"	724.5
05.65	1	"	"	726.5
05.35	1	"	"	728.8
04.80	1	"	"	733.1
04.58	1	"	"	734.7
04.35	1	"	"	736.5
03.95	1	"	"	739.5
03.65	1	"	"	741.8
03.28	1	"	"	744.7
02.67	1	"	"	749.4
02.45	1n	"	"	751.1
01.6	1n	"	"	758
01.3	1b	"	"	760
00.9	1n	"	"	763
00.7	1n	"	"	765
00.02	2	"	"	769.8
3599.50	1	"	"	773.8
99.13	1	"	"	776.8
98.72	1	"	"	779.9
98.4	1n	"	"	782
98.25	1n	"	"	783.4
97.95	1	"	"	785.8
97.78	1	"	"	786.2
97.40	1	"	"	789.1
97.31	1	"	"	789.8
97.01	1	"	"	793.1
96.2	1n	"	"	799
95.69	1	"	"	803.4
95.14	2	"	"	807.6
94.25	1d	"	"	814.3
93.88	1	"	7.9	817.1
93.68	1	"	"	818.1
93.40	1	"	"	820.9
92.92	1d	"	"	824.7
92.50	1	"	"	827.9
92.03	1	"	"	831.4
91.74	1	"	"	833.6
91.4	1n	"	"	836
90.71	1	"	"	841.9
90.48	1	"	"	843.6
90.1	1b	"	"	846.5
89.9	1b	"	"	848

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
3589.3	1b	1.00	7.9	27853
88.5	1b	"	"	859
88.05	1n	"	"	862.4
87.70	1	"	"	865.1
87.2	1b	"	"	869
86.5	1b	"	"	874.5
86.02	1n	"	"	878.3
85.54	1	"	"	881.9
85.33	1	"	"	883.5
85.05	3	"	"	885.6
84.13	1	"	"	892.5
83.6	1n	"	"	897
83.4	1n	"	"	899
83.00	1	"	"	901.7
82.23	2	"	"	907.8
82.02	2	"	"	909.4
81.41	1	"	"	914.0
80.45	1n	"	"	921.2
80.30	1n	"	"	922.7
79.96	1	"	"	925.6
79.56	1	"	"	928.6
79.12	1	"	"	931.9
78.97	1n	"	"	933.0
78.53	1	"	"	936.3
78.1	1b	"	"	940
77.26	1	0.99	"	946.7
77.05	1	"	"	948.3
76.78	1	"	"	950.3
76.41	2	"	"	953.1
75.97	1	"	"	956.4
75.64	1	"	"	958.9
74.98	1n	"	"	965.3
74.55	1	"	"	968.5
74.25	1	"	"	970.7
73.40	1	"	"	976.7
73.10	1	"	"	979.1
72.75	1n	"	"	982.0
72.55	1	"	"	983.6
72.27	1	"	"	985.7
71.85	1	"	"	988.8
71.42	1	"	"	992.0
71.19	1	"	"	993.8
70.80	1	"	"	997.0
70.34	1	"	"	28000.4
70.05	1	"	"	002.5
69.85	1	"	"	004.4
69.72	1	"	"	008.4
69.25	2	"	"	009.2
68.97	1	"	"	011.4
68.83	1	"	"	012.5
68.45	1	"	"	015.5
68.19	1	"	"	017.6
67.97	1	"	"	019.3
67.65	1	"	"	021.8
67.18	1	"	"	025.6



URANIUM *-continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3566.78	2	0.99	7.9	28029.6
66.55	1	"	"	030.2
65.93	2	"	"	035.1
65.56*	1	"	"	038.1
65.20	1n	"	"	040.9
65.07	1	"	"	041.9
64.78	1	"	"	044.2
64.40	1	"	"	047.3
64.1	1n	"	"	050
63.85	1	"	"	051.7
63.60	1	"	"	053.6
63.50	1	"	"	054.4
63.23	1	"	"	056.4
62.25	1n	"	"	064.2
61.95	2	"	"	066.6
61.62	1	"	"	069.2
61.24	1	"	"	072.2
60.65	1n	"	"	076.9
60.5	1n	"	"	078
60.10	1	"	"	081.2
59.21	1	"	"	088.2
58.71	1	"	"	092.2
58.22	1	"	"	096.0
58.00	1	"	"	097.8
57.75	1	"	"	099.8
57.49	1	"	"	101.8
57.15	1	"	"	104.5
56.75	1	"	"	107.6
56.43	1	"	"	110.1
56.05	1	"	"	118.7
55.70	1	"	"	115.9
55.52	1	"	"	117.3
55.00	1n	"	"	121.5
54.70	1n	"	"	123.9
54.43	1	"	"	126.0
54.00	1n	"	"	129.4
53.62	1n	"	"	132.4
53.1	1b	"	"	136
52.84	1	"	"	148.5
52.36	2	"	"	142.2
51.95	1n	"	8.0	145.5
51.49	1	"	"	149.2
51.24	1	"	"	151.2
51.02	2	"	"	152.9
50.77	1	"	"	154.9
50.68	1	"	"	155.6
50.43	1	"	"	157.6
49.88	1n	"	"	161.9
49.36	1	"	"	166.1
48.95	1n	"	"	169.3
48.4	1b	"	"	174
47.96	1	"	"	177.2
47.70	1	"	"	179.3

\* Fe?

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3547·36	2	0·99	8·0	28182·0
46·90	2	"	"	185·6
46·55	2	"	"	188·4
46·31	1	"	"	190·3
45·86	2	"	"	193·9
44·86	1	"	"	201·8
44·40	1	"	"	205·5
44·11	1	"	"	207·8
43·90	1	"	"	209·5
43·58	1	"	"	212·1
43·35	1	"	"	213·9
42·9	1n	"	"	217·5
42·5	1n	"	"	221
42·06	1	"	"	224·0
41·45	1	"	"	228·9
41·15	1	"	"	231·4
40·82	1	"	"	234·0
40·64	2	"	"	235·5
39·81	1	"	"	242·1
39·60	1	"	"	243·8
39·40	1	"	"	245·4
39·10	1	"	"	247·8
38·81	1	"	"	250·1
38·57	1	"	"	252·0
38·35	1	"	"	253·8
38·00	1	0·98	"	256·6
37·60	1	"	"	259·8
37·23	1	"	"	262·8
36·95	1	"	"	265·1
36·52	1	"	"	268·3
36·25	1n	"	"	270·5
36·0	1b	"	"	272
35·8	1b	"	"	274
35·3	1b	"	"	278
35·1	1b	"	"	280
34·50	1	"	"	284·5
34·23	1	"	"	286·8
33·75	2	"	"	290·5
33·18	1	"	"	295·1
32·97	1	"	"	296·8
32·80	1	"	"	298·2
32·3	1n	"	"	302
31·85	1	"	"	305·7
31·29	2	"	"	310·3
31·1	1n	"	"	312
30·30	1	"	"	318·2
29·95	1n	"	"	320·9
29·75	1	"	"	322·5
29·35	1	"	"	325·7
29·26	1	"	"	326·6
28·87	2	"	"	329·6
28·50	1	"	"	332·6
28·20	1d	"	"	335·1
27·78	1	"	"	338·5
27·00	1	"	"	344·7

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3526.74	1	0.98	8.0	28346.8
26.25	1	"	"	350.7
25.98	1	"	"	352.9
25.88	1	"	"	353.7
25.35	1	"	"	358.0
24.93	1	"	"	361.4
24.62	1	"	"	363.8
23.77	2	"	"	370.7
23.52	1	"	"	372.7
22.9	1b	"	"	378
22.72	1n	"	"	379.2
22.22	1	"	"	383.2
21.67	1	"	"	387.6
20.98	2	"	"	393.2
20.15	2	"	"	399.8
19.91	1	"	"	401.7
19.55	1n	"	"	404.6
19.16	1	"	"	407.8
18.92	1	"	"	409.8
18.69	1	"	"	411.6
17.84	1	"	"	418.4
17.62	1	"	"	420.3
17.40	1	"	"	422.1
17.23	1	"	"	423.5
17.03	1	"	"	425.1
16.65	1	"	"	428.2
15.56	1	"	"	437.0
15.43	1	"	"	438.1
15.10	1	"	"	440.7
14.83	1	"	"	442.9
14.65	1n	"	"	444.3
13.85	1n	"	"	450.8
13.56	1	"	"	453.2
13.25	1	"	"	455.7
12.86	1	"	"	458.9
12.64	1	"	"	460.7
12.40	1	"	"	462.6
12.06	1	"	"	465.3
11.80	1	"	"	467.7
11.65	1	"	"	468.8
11.20	1n	"	"	472.3
11.03	1	"	"	473.7
10.65	1nd	"	"	476.7
10.25	1	"	"	480.0
09.85	2	"	"	483.2
09.52	1	"	"	485.8
09.25	1	"	8.1	488.0
09.21	1	"	"	488.3
08.49	1n	"	"	494.1
07.9	1n	"	"	499
07.47	1	"	"	402.5
07.22	1	"	"	404.5
06.95	1	"	"	406.7
06.75	1	"	"	508.3
06.50	1	"	"	510.4

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3505.65	1n	0.98	8.1	28517.3
05.28	1	"	"	520.3
05.20	1	"	"	520.9
04.85	1	"	"	523.7
04.62	1	"	"	525.6
04.17	1n	"	"	529.2
03.97	1n	"	"	531.0
03.50	1n	"	"	534.8
03.16	1n	"	"	537.5
02.79	1	"	"	540.4
02.48	1n	"	"	543.0
01.9	1b	"	"	548
01.47	1	"	"	551.4
01.15	1nd	"	"	554.0
00.65	1	"	"	558.2
00.55	1	"	"	559.8
00.27	1	"	"	561.3
3499.98	1	"	"	563.5
99.53	1	"	"	567.2
99.25	1	"	"	569.5
98.90	1	0.97	"	572.3
98.78	1	"	"	573.4
98.57	1	"	"	575.1
98.37	1	"	"	576.8
97.81	1	"	"	581.1
97.45	1	"	"	584.1
97.23	1	"	"	585.9
97.05	1	"	"	587.4
96.7	1n	"	"	590
96.57	1	"	"	591.4
96.13	1	"	"	595.0
95.87	1	"	"	597.2
95.04	2	"	"	604.1
94.19	1	"	"	610.6
93.87	1	"	"	613.3
93.52	2	"	"	616.2
92.97	1	"	"	620.8
92.4	1b	"	"	625.5
92.0	1b	"	"	629
91.55	1	"	"	632.5
90.97	1	"	"	637.3
90.77	1	"	"	639.0
90.43	2	"	"	641.6
89.75	2	"	"	647.2
89.53	1	"	"	649.0
89.00	1	"	"	653.4
88.35	1i	"	"	658.8
87.75	1n	"	"	663.7
87.25	1n	"	"	667.9
87.07	1n	"	"	669.2
86.47	1	"	"	674.1
86.16	1	"	"	676.7
85.45	1	"	"	682.6
85.10	1	"	"	685.5
84.71	1	"	"	688.7



URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3484.48	1	0.97	8.1	28690.1
83.98	1	"	"	694.7
83.73	1n	"	"	696.8
83.30	1	"	"	700.3
82.67	2	"	"	705.5
82.40	1	"	"	707.7
81.9	1b	"	"	712
81.3	1b	"	"	717
80.49	2	"	"	723.4
79.99	1	"	"	727.6
79.40	1	"	"	732.5
78.47	1	"	"	740.1
78.01	1	"	"	744.0
77.68	1	"	"	746.6
77.26	1	"	"	750.1
76.65	1	"	"	755.2
76.30	1	"	"	758.1
76.08	1	"	"	759.9
75.88	1	"	"	761.6
75.18	1	"	"	767.4
74.75	2	"	"	770.0
74.35	1	"	"	774.3
73.90	1n	"	"	778.0
73.57	1n	"	"	780.7
73.19	1	"	"	783.9
73.00	1	"	"	785.5
72.73	1	"	"	787.7
72.67	1	"	"	788.2
72.25	1	"	"	791.7
71.90	1	"	"	794.6
71.26	1	"	"	799.9
70.8	1n	"	8.2	804
70.47	1	"	"	808.8
69.96	1	"	"	810.5
69.7	1b	"	"	813
69.38	1	"	"	815.4
69.28	1	"	"	816.2
68.70	1n	"	"	821.0
68.26	1n	"	"	824.7
67.85	1n	"	"	828.1
67.3	1b	"	"	833
66.80	1	"	"	837.8
66.50	1	"	"	839.3
66.05	1n	"	"	843.2
65.6	1nd	"	"	847
65.12	1	"	"	850.8
64.82	1	"	"	853.3
64.41	1	"	"	856.7
63.82	2	"	"	861.6
63.50	1	"	"	864.3
62.87	1n	"	"	869.5
62.40	1	"	"	873.5
62.17	1	"	"	875.4
61.65	1n	"	"	879.8
61.19	1	"	"	883.6

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3461.00	1	0.97	8.2	28885.2
60.64	1	"	"	888.2
60.55	1	"	"	888.9
60.10	1	"	"	892.7
59.88	1	"	"	894.6
59.5	1n	"	"	898
59.3	1n	"	"	899
59.1	1b	"	"	901
58.85	1	0.96	"	903.3
58.37	1	"	"	907.4
57.89	2	"	"	911.6
57.24	2	"	"	916.4
56.74	1	"	"	920.7
56.50	1	"	"	922.8
56.1	1n	"	"	926
55.91	1	"	"	927.9
55.57	1	"	"	930.9
55.00	1	"	"	935.4
54.80	1n	"	"	937.0
54.40	1n	"	"	940.4
54.26	1	"	"	941.2
53.98	1	"	"	943.8
53.72	2	"	"	945.9
53.1	1n	"	"	951
52.92	1n	"	"	952.8
52.63	1n	"	"	955.4
52.52	1n	"	"	956.3
52.1	1b	"	"	960
51.8	1n	"	"	962
51.41	2	"	"	965.5
50.15	1n	"	"	975.8
49.40	1	"	"	982.3
48.94	1	"	"	986.3
48.57	1	"	"	989.5
48.36	1	"	"	991.3
47.95	1n	"	"	994.5
47.47	1n	"	"	998.7
46.88	1	"	"	29003.3
46.73	1	"	"	004.6
46.47	1	"	"	006.7
46.23	1	"	"	008.9
46.00	1	"	"	010.9
45.83	1	"	"	012.4
45.45	1n	"	"	015.7
45.15	1n	"	"	018.3
44.90	1	"	"	020.2
44.85	1	"	"	020.6
44.53	1	"	"	023.4
43.97	1n	"	"	028.6
43.66	1	"	"	031.0
43.10	1	"	"	035.4
42.80	1	"	"	038.0
42.55	1	"	"	040.5
42.45	1	"	"	041.3
41.95	1	"	"	045.1

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3441.65	1n	0.96	8.2	29047.7
41.15	1	"	"	051.9
40.74	1	"	"	055.3
40.37	1	"	"	058.5
40.20	1	"	"	059.9
40.07	1	"	"	061.0
39.58	1	"	"	065.1
39.25	1	"	"	068.0
38.84	1	"	"	071.5
38.56	1	"	"	073.9
38.08	1	"	"	077.8
37.31	1	"	"	084.2
37.18	1	"	"	085.3
36.93	2	"	"	087.5
36.20	1	"	"	093.7
35.65	2	"	"	098.4
35.32	1	"	"	101.2
34.92	1	"	"	104.4
34.70	1	"	"	106.3
34.42	2	"	"	109.2
33.85	1	"	"	113.6
33.6	1b	"	"	116
33.2	1b	"	"	119.5
32.67	1	"	8.3	123.5
32.15	1	"	"	127.9
31.65	1	"	"	132.2
31.23	1	"	"	135.8
30.87	1n	"	"	138.8
30.60	1	"	"	141.2
30.35	1	"	"	143.2
29.47	1n	"	"	150.7
29.05	1n	"	"	154.3
28.30	1b	"	"	160.7
28.06	1	"	"	162.7
27.90	1	"	"	164.1
27.58	1	"	"	166.7
27.20	1	"	"	170.0
26.72	1	"	"	174.1
26.52	2	"	"	175.8
25.97	1	"	"	180.5
25.66	1n	"	"	183.4
25.48	1n	"	"	184.7
25.25	1n	"	"	186.6
24.96	1	"	"	189.1
24.69	1	"	"	191.4
24.45	1	"	"	193.5
24.25	1	"	"	195.2
23.9	1n	"	"	198
23.16	2	"	"	204.5
22.63	1	"	"	209.0
22.45	1	"	"	210.5
21.85	2	"	"	215.7
21.52	1	"	"	218.5
21.30	1	"	"	217.3
21.17	1	"	"	221.5

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuum
		$\lambda +$	$\frac{1}{\lambda} -$	
3420.67	1nd	0.96	8.3	29225.7
20.22	1	"	"	229.6
20.02	1	"	"	231.3
19.72	1n	"	"	233.9
19.55	1n	"	"	235.3
19.20	1n	"	"	232.9
18.73	1n	"	"	242.3
18.55	1n	"	"	243.9
18.30	1	"	"	246.0
17.62	1	0.95	"	251.8
17.50	1	"	"	252.8
17.00	1	"	"	257.1
16.70	1	"	"	259.7
16.46	1	"	"	261.8
16.28	1	"	"	263.3
16.04	1	"	"	265.4
15.75	1	"	"	267.8
15.53	1n	"	"	269.7
14.80	1n	"	"	276.0
14.50	1	"	"	278.6
14.00	2	"	"	282.8
13.50	1n	"	"	287.1
13.22	1n	"	"	289.5
12.90	1n	"	"	292.3
12.50	2	"	"	295.7
12.26	2	"	"	297.8
11.70	1	"	"	302.6
11.40	1	"	"	305.2
11.25	1	"	"	305.5
10.75	1	"	"	310.8
10.55	1	"	"	312.5
10.31	1	"	"	320.1
09.96	1	"	8.3	317.6
09.85	1	"	"	318.5
09.52	1	"	"	320.3
09.36	1	"	"	322.7
09.11	1	"	"	324.9
08.96	1	"	"	326.2
08.74	1	"	"	328.0
08.17	1n	"	"	333.0
08.03	1	"	"	334.2
07.50	1	"	"	338.7
07.05	1	"	"	342.6
06.76	1	"	"	345.1
06.44	1	"	"	347.9
05.88	1	"	"	352.7
05.73	1	"	"	354.1
05.32	1n	"	"	357.5
05.08	1	"	"	359.6
04.40	1	"	"	365.4
04.02	1	"	"	368.7
03.72	1	"	"	371.3
03.37	1n	"	"	374.4
02.90	1	"	"	378.3
02.60	1d	"	"	381.0



URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3402.03	1	0.95	8.3	29385.9
01.37	1	"	"	391.6
01.15	1	"	"	393.5
00.90	1	"	"	395.5
00.66	1	"	"	397.8
00.45	1	"	"	399.5
00.35	1	"	"	400.4
00.06	1	"	"	402.9
3399.83	1	"	"	404.9
99.64	1	"	"	406.6
99.40	1	"	"	408.6
98.75	1	"	"	414.3
98.40	1	"	"	417.2
98.10	1	"	"	419.9
97.75	1	"	"	422.9
97.30	1b	"	"	426.8
97.10	1b	"	"	428.6
96.71	1	"	8.4	432.0
96.58	1	"	"	433.0
96.20	1	"	"	436.2
95.73	2	"	"	440.3
95.48	2	"	"	442.4
94.92	2	"	"	447.4
94.45	1	"	"	451.5
94.05	2	"	"	459.9
93.33	1	"	"	461.2
93.12	1	"	"	463.0
92.81	1	"	"	465.7
92.50	1b	"	"	466.3
91.37	1	"	"	478.2
91.19	1	"	"	479.8
90.98	1	"	"	481.6
90.45	2	"	"	486.2
90.10	1n	"	"	489.2
89.88	1	"	"	491.2
89.50	1n	"	"	594.5
89.21	1d	"	"	597.0
88.65	1n	"	"	500.9
88.50	1n	"	"	503.2
88.17	1n	"	"	506.1
87.30	1b	"	"	513.6
86.65	1n	"	"	519.3
86.26	2	"	"	522.7
85.79	1	"	"	526.8
85.50	1	"	"	529.3
84.7	1n	"	"	536
84.58	1	"	"	537.4
84.37	1	"	"	539.2
84.15	1	"	"	541.1
83.94	1	"	"	542.9
83.55	1	"	"	546.3
82.80	1	"	"	552.9
82.45	1	"	"	556.0
82.11	2	"	"	565.0
81.00	1	"	"	568.6

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3380.83	2	0.95	8.4	29570.1
80.37	ln	"	"	574.2
79.95	1	"	"	577.8
79.80	1	"	"	579.1
79.52	1	"	"	581.6
79.00	ln	"	"	586.1
78.87	ln	"	"	587.3
78.40	ln	"	"	591.5
78.15	ln	"	"	593.6
77.55	1	0.94	"	598.9
77.20	lb	"	"	601.9
76.68	1	"	"	606.5
75.95	2	"	"	612.9
75.05	1	"	"	620.8
74.6	ln	"	"	623
74.32	1	"	"	627.2
74.22	1	"	"	628.1
73.84	1	"	"	631.4
73.57	ln	"	"	633.8
73.20	ln	"	"	637.0
72.74	lnd	"	"	640.1
72.18	1	"	"	646.0
71.45	2	"	"	652.4
71.15	1	"	"	655.1
71.06	1	"	"	656.1
70.83	1	"	"	657.9
70.60	1	"	"	659.8
70.28	1	"	"	662.7
70.11	1	"	"	666.2
69.82	1	"	"	666.8
69.4	lb	"	"	669.5
69.00	1	"	"	674.0
68.90	1	"	"	674.9
68.44	1	"	"	678.9
68.02	1	"	"	682.6
67.85	1	"	"	684.1
67.68	1	"	"	685.6
67.50	1	"	"	687.2
66.99	1	"	"	692.5
66.70	1	"	"	694.3
66.50	1	"	"	696.0
65.77	ln	"	"	702.5
65.30	ln	"	"	706.6
64.78	ln	"	"	711.2
64.05	ln	"	"	717.7
63.60	1	"	"	721.5
63.40	1	"	"	723.5
62.87	ln	"	"	728.5
62.15	ln	"	"	734.4
61.86	1	"	"	737.0
61.37	1	"	8.5	741.3
60.97	1	"	"	744.8
60.80	1	"	"	746.3
60.50	1	"	"	749.0
60.27	1	"	"	751.0

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3359.73	1	0.94	85	29755.8
59.2	1n	"	"	760.5
59.05	1n	"	"	761.8
58.75	1	"	"	764.5
58.60	1	"	"	765.7
58.06	2	"	"	770.6
57.70	1n	"	"	773.8
57.32	1n	"	"	777.3
56.65	1n	"	"	783.1
56.35	1	"	"	785.8
56.15	1	"	"	787.6
56.00	1	"	"	788.9
55.56	1n	"	"	792.8
55.24	1	"	"	778.0
54.94	1	"	"	798.3
54.65	2	"	"	799.9
54.22	1n	"	"	805.7
53.75	1	"	"	808.9
53.40	1	"	"	812.0
53.20	1	"	"	812.9
52.81	1	"	"	817.2
51.98	1	"	"	824.6
51.83	1	"	"	825.9
51.40	1	"	"	829.8
51.05	1	"	"	832.9
50.80	1d	"	"	835.7
50.45	1n	"	"	838.2
50.20	1n	"	"	840.5
49.56	2	"	"	845.6
49.19	1	"	"	849.4
48.85	1n	"	"	852.5
48.45	1n	"	"	856.0
48.00	1	"	"	860.1
47.72	1	"	"	862.5
47.17	1	"	"	867.5
46.87	1	"	"	870.1
46.56	1	"	"	872.9
46.35	1	"	"	874.8
46.13	1	"	"	876.8
46.00	1	"	"	877.9
45.67	1	"	"	880.9
45.00	2	"	"	886.9
44.45	1n	"	"	891.8
44.2	1b	"	"	894
43.60	1	"	"	899.4
43.1	1n	"	"	904
42.83	2	"	"	906.3
42.5	1n	"	"	909
41.83	2	"	"	915.2
41.1	1n	"	"	922
40.80	1n	"	"	924.5
40.47	1	"	"	927.4
40.23	1	"	"	929.6
39.56	1	"	"	935.6
39.37	1	"	"	937.3

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3339.15	1	0.94	8.5	29939.2
39.00	1	"	"	940.6
38.62	1	0.93	"	943.0
38.10	1	"	"	948.7
37.93	2	"	"	950.2
37.50	1	"	"	954.0
36.84	1	"	"	960.0
36.42	1	"	"	963.7
36.12	1n	"	"	966.3
35.78	1	"	"	969.5
35.4	1b	"	"	973
34.99	1	"	"	976.6
34.60	1	"	"	980.1
34.40	1	"	"	981.9
34.10	1	"	"	984.6
33.40	1	"	"	990.9
32.60	1d	"	"	998.1
32.12	1	"	"	30001.3
31.93	1	"	"	004.1
31.45	1	"	"	008.5
31.12	1	"	"	011.4
30.93	1	"	"	013.2
30.65	1	"	"	015.5
30.50	1	"	"	017.0
30.08	2d (Mg)	"	"	022.2
29.65	1	"	"	024.7
29.47	1	"	"	026.3
29.15	1	"	"	029.2
28.70	1	"	"	033.3
28.40	1	"	"	036.0
27.66	1	"	"	042.7
27.42	1	"	"	044.8
27.20	1	"	"	046.8
26.88	1	"	"	050.5
26.52	1	"	"	053.4
26.32	1	"	"	055.2
25.84	1	"	"	059.1
25.36	1n	"	"	063.4
24.77	1n	"	"	068.5
23.50	1n	"	8.6	080.0
23.25	1	"	"	082.1
23.13	1	"	"	083.5
22.83	1	"	"	086.1
22.55	1	"	"	088.7
22.26	1	"	"	091.4
21.9	1n	"	"	095
21.51	1	"	"	098.3
21.37	1	"	"	099.5
21.07	1	"	"	002.2
20.46	1	"	"	007.7
19.46	2	"	"	016.9
19.00	1	"	"	121.0
18.43	1	"	"	126.2
18.35	1	"	"	126.9
17.99	1	"	"	130.1



URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
3317.62	1	0.93	8.6	30133.5
17.37	1	"	"	135.7
16.90	1	"	"	140.0
16.7	1b	"	"	142
16.1	1b	"	"	147
15.23	1	"	"	155.2
14.73	1	"	"	159.8
14.22	1	"	"	164.4
14.13	1	"	"	165.2
13.91	1	"	"	167.2
13.25	1n	"	"	173.2
12.64	1	"	"	178.8
12.0	1n	"	"	185
11.87	2	"	"	185.8
11.55	1n	"	"	188.8
11.1	1nd	"	"	193
10.65	1	"	"	197.1
09.82	1	"	"	204.5
09.45	1	"	"	207.9
09.37	1	"	"	208.7
09.08	1	"	"	211.3
08.60	1n	"	"	215.7
08.40	1n	"	"	217.5
08.1	1n	"	"	220
07.72	2	"	"	223.7
07.4	1b	"	"	227
06.7	1	"	"	233
06.39	1	"	"	235.8
06.06	3	"	"	238.8
05.3	1b	"	"	246
04.85	1n	"	"	250.0
03.73	1	"	"	262.0
03.46	1	"	"	262.7
03.17	1	"	"	265.3
03.02	1	"	"	266.7
02.67	1	"	"	269.8
02.43	1	"	"	272.1
01.97	1	"	"	276.4
01.75	1	"	"	278.4
01.47	1	"	"	280.9
01.32	1	"	"	282.3
00.95	1	"	"	285.7
00.87	1	"	"	286.4
00.6	1	"	"	289
00.33	1	"	"	291.4
3299.99	1	0.92	"	294.5
99.86	1	"	"	295.7
99.25	1	"	"	301.1
98.61	1	"	"	307.0
98.06	2	"	"	312.3
97.72	1	"	"	315.4
97.3	1	"	"	319
96.95	1	"	"	322.5
96.67	1	"	"	325.0
96.42	1	"	"	327.3

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3295.95	1	0.92	8.6	30331.7
95.69	1	"	"	334.1
95.37	1	"	"	337.0
95.00	1	"	"	340.4
94.28	1n	"	"	347.0
94.13	1	"	"	348.2
93.77	1	"	"	351.7
93.15	1	"	"	357.5
92.51	1	"	"	363.4
91.51	3	"	"	372.6
91.23	1	"	"	375.5
91.10	1	"	"	376.4
90.63	1	"	"	380.7
90.27	1	"	"	384.0
89.60	1	"	"	390.3
89.50	1	"	"	391.2
88.75	1	"	8.7	398.0
88.38	2	"	"	401.4
88.06	1	"	"	404.4
87.63	2	"	"	408.3
86.8	1n	"	"	416
86.63	1	"	"	417.6
86.42	1	"	"	419.6
86.09	1	"	"	422.6
85.76	1	"	"	425.6
85.44	2	"	"	428.6
85.20	1	"	"	430.8
84.80	1	"	"	434.5
84.53	1	"	"	437.1
84.17	1	"	"	440.4
83.92	1	"	"	442.7
83.30	1n	"	"	448.5
82.8	1n	"	"	453
82.68	1	"	"	454.2
82.3	1n	"	"	459
81.83	1	"	"	462.1
81.70	1	"	"	464.3
81.26	1	"	"	468.4
80.95	1	"	"	470.3
80.80	1	"	"	471.7
80.53	1	"	"	474.1
80.20	1	"	"	477.2
79.75	1	"	"	481.4
79.38	1	"	"	484.9
79.25	1	"	"	486.0
78.6	1b	"	"	492.1
77.7	2b	"	"	500.5
77.27	1	"	"	504.5
76.80	1	"	"	508.9
76.32	1	"	"	513.3
75.6	1b	"	"	520
74.70	1	"	"	528.5
74.40	1	"	"	531.3
74.12	1	"	"	533.9
73.65	1n	"	"	538.3

## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3273.45	1n	0.92	8.7	30540.1
73.25	1n	"	"	542.0
72.75	1n	"	"	546.6
72.33	1n	"	"	550.6
71.65	1	"	"	556.9
71.3	1b	"	"	560.5
70.73	1	"	"	565.
70.32	2	"	"	569.3
69.95	1	"	"	572.8
69.65	1	"	"	575.6
69.20	1	"	"	579.8
68.95	1n	"	"	582.2
68.8	1n	"	"	584
68.35	1	"	"	587.8
67.93	1	"	"	591.7
67.80	1	"	"	592.9
67.40	1	"	"	596.7
67.17	1	"	"	599.8
66.68	1	"	"	603.4
66.35	1	"	"	606.5
66.07	1	"	"	609.1
65.99	2	"	"	609.9
64.83	1n	"	"	620.8
64.55	1n	"	"	623.4
63.93	1	"	"	639.2
63.67	1	"	"	631.6
63.28	1	"	"	635.3
63.00	1	"	"	637.9
62.80	1	"	"	639.8
61.89	1	"	"	648.4
61.27	1	"	"	654.2
61.15	1	"	"	655.3
61.05	1	"	"	656.3
60.70	1	"	"	659.6
59.99	1	0.91	"	666.2
59.65	1n	"	"	669.4
59.08	1n	"	"	674.8
58.55	1	"	"	679.8
58.23	1	"	"	682.8
57.95	1	"	"	685.4
57.50	1	"	"	689.7
57.40	1	"	"	690.6
56.88	1	"	"	695.5
56.60	1	"	"	698.2
56.18	1	"	"	702.1
55.50	1	"	"	708.5
55.20	1	"	"	711.4
55.00	1	"	"	713.3
54.73	1n	"	"	715.8
54.44	1	"	"	718.5
53.50	1	"	"	727.4
52.95	1n	"	"	732.6
52.80	1	"	"	733.9
52.50	1	"	"	736.8
52.3	1n	"	"	739

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
3251.15	1n	0.91	8.7	30749.6
51.00	1	"	"	751.0
50.50	1	"	"	755.7
50.07	1	"	"	759.8
49.62	1	"	"	764.0
49.37	1	"	"	766.4
49.12	1	"	"	768.8
48.52	1	"	"	774.5
48.17	1	"	"	777.8
47.96	1	"	"	779.8
47.75	1	"	"	781.8
47.43	1	"	"	784.8
46.55	1	"	"	793.1
46.33	2	"	"	795.2
45.95	1n	"	"	798.8
44.98	1	"	"	808.0
44.69	1	"	"	810.7
44.39	2	"	"	813.6
43.85	1	"	"	818.8
42.90	1d	"	"	827.8
42.17	1	"	"	834.7
41.77	1	"	"	838.5
41.30	1	"	"	843.0
41.00	1	"	"	845.9
40.55	1	"	"	850.2
40.30	1	"	"	851.6
39.80	1	"	"	857.3
39.65	1	"	"	858.7
38.62	1	"	"	868.6
38.10	1n	"	"	873.5
37.4	1b	"	"	880
36.93	1	"	"	884.7
36.4	1n	"	"	890
35.44	1	"	"	898.9
35.20	1n	"	"	901.2
34.70	1n	"	"	906.0
34.14	1n	"	"	911.3
33.53	1	"	"	917.1
32.83	1n	"	"	923.8
32.33	2	"	"	928.6
32.13	1	"	"	930.5
31.2	1b	"	"	939.5
30.3	1b	"	"	948
29.65	3	"	"	954.3
28.7	1b	"	"	963
27.6	1b	"	"	974
27.33	1	"	"	976.5
26.97	1	"	"	980.0
26.33	2	"	"	986.2
25.9	1n	"	"	990
24.45	2	"	"	31004.2
23.88	1	"	"	009.7
23.65	1	"	"	011.9
23.2	1b	"	"	016
22.65	1	"	"	021.6



## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3222.46	1	0.91	8.7	31023.4
22.16	1	"	"	026.3
21.55	1n	"	"	032.1
19.9	1n	0.90	"	048
19.36	1	"	"	053.3
18.50	2	"	"	061.6
18.29	1	"	"	063.6
17.89	1	"	"	067.5
17.18	1	"	"	074.3
16.75	1	"	"	078.5
16.13	1	"	"	084.5
15.29	1	"	"	092.6
14.96	1	"	"	095.8
14.87	1	"	"	096.7
14.42	1	"	"	100.9
14.05	1	"	"	104.5
13.80	1	"	"	106.9
13.52	1	"	"	109.7
13.25	1	"	"	112.3
12.77	1	"	"	116.9
12.00	1	"	"	124.3
11.45	1n	"	"	129.7
11.20	1	"	"	132.1
10.8	1b	"	"	136
10.10	1	"	"	142.8
09.8	1	"	"	146
09.32	1	"	"	150.3
08.7	1b	"	"	156
08.27	1n	"	"	160.5
07.4	1b	"	"	169
06.37	1	"	"	179.0
06.18	1	"	"	180.9
05.9	1n	"	"	184
05.25	1	"	"	189.9
04.79	1	"	"	194.4
04.45	1	"	"	197.7
03.9	1nd	"	"	223
03.55	1	"	"	206.5
03.38	1	"	"	208.1
02.95	1n	"	"	212.3
02.65	1n	"	"	215.2
01.75	1	"	"	203.1
01.4	1b	"	"	227.5
00.80	1	"	"	233.3
00.30	2	"	"	238.2
3199.75	1	"	"	243.5
99.38	1	"	"	247.2
99.0	1nd	"	"	251
98.45	1n	"	"	256.2
98.30	1	"	"	257.7
96.90	1	"	"	271.4
96.2	1b	"	"	278
95.7	1b	"	"	283
95.0	1b	"	"	290
94.1	1b	"	"	299

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3193.45	1	0.90	8.7	31304.9
93.36	1	"	"	305.8
92.82	1	"	"	311.2
92.30	1	"	"	316.4
91.90	1	"	"	320.4
91.02	1	"	"	329.2
90.86	1	"	"	330.8
90.6	1n	"	"	333
89.65	1	"	"	342.7
89.17	1	"	"	347.2
88.50	1n	"	"	353.8
87.65	1n	"	"	362.2
86.35	1n	"	"	375.0
85.85	1	"	"	379.9
85.33	1n	"	"	385.0
84.9	1b	"	"	389
84.60	1b	"	"	392.3
84.15	1n	"	"	396.7
83.63	1	"	"	401.8
83.00	1	"	"	408.0
82.72	1	"	"	410.8
81.5	1n	"	"	423
81.2	1b	"	"	426
80.75	1n	"	"	430.1
80.48	1n	"	"	432.8
80.33	1	"	"	434.3
79.98	1	"	"	437.7
79.50	1	"	"	442.4
79.18	1	"	"	445.6
79.03	1	"	"	447.1
78.45	1	"	"	452.9
77.79	1	"	"	459.4
77.48	2	"	"	462.5
76.78	1	"	"	469.4
76.34	2	"	"	474.8
75.50	1	"	"	482.1
74.96	1	"	"	487.5
74.15	1	"	"	495.5
73.82	1	"	"	498.8
72.8	1b	"	"	509
72.24	1n	"	"	514.5
71.95	1	"	"	517.3
71.53	1	"	"	521.6
71.22	1	"	"	524.6
70.96	1	"	"	527.2
70.69	1	"	"	529.9
70.48	1	"	"	532.0
70.2	1b	"	"	535
69.2	1b	"	"	545
68.55	1n	"	"	551.2
68.33	1n	"	"	553.4
67.9	1b	"	"	558
67.22	2	"	"	564.5
66.64	1	"	"	570.3
65.62	1	"	"	580.5

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3165.41	1	0.90	8.7	31582.6
65.20	1	"	"	584.6
64.29	1	"	"	593.7
63.90	1	"	"	597.6
63.10	1	"	"	605.6
62.95	1	"	"	607.0
62.4	1b	"	"	612.6
61.95	1	"	"	617
61.66	1	"	"	620.0
60.90	1	"	"	627.6
60.48	1	"	"	631.8
60.06	1	"	"	636.0
59.94	1	"	"	637.2
59.41	1	"	"	642.5
59.06	1	"	"	646.0
58.7	1n	"	"	650
58.3	1n	"	"	654
57.97	1	"	"	656.9
57.57	1	"	"	660.9
56.70	1	"	"	669.6
56.22	2	"	"	674.4
55.98	1	"	"	676.9
55.53	1	"	"	681.4
55.40	1	"	"	682.7
55.02	1	"	"	686.5
54.55	1d	"	"	691.2
54.30	1n	"	"	693.8
53.62	1	"	"	700.5
53.36	2	"	"	703.2
52.57	1	"	"	711.1
52.45	1	"	"	712.3
51.81	1	"	"	718.8
51.2	1b	"	"	725
50.90	1	"	"	728.0
50.62	1	"	"	730.8
50.50	1	"	"	732.0
50.10	1n	"	"	736.0
49.76	1	"	"	739.4
49.34	2	"	"	743.6
49.17	1	"	"	745.3
48.85	1	"	"	748.6
48.73	1	"	"	749.8
48.40	1	"	"	753.2
48.28	1	"	"	754.4
47.93	1	"	"	757.9
47.19	1	"	"	765.4
46.85	1	"	9.1	768.8
46.43	1	"	"	773.0
46.2	1	"	"	775
45.67	1	"	"	780.7
45.47	1	"	"	782.7
45.09	1	"	"	786.5
44.84	1	"	"	789.1
43.45	1	"	"	803.1
42.74	1	"	"	810.6

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3142.46	1	0.90	9.1	31813.2
42.03	1		"	817.5
41.75	1	0.88	"	820.4
39.69	2	"	"	841.3
39.29	1	"	"	845.3
38.99	1	"	"	848.3
38.6	1n	"	"	852
38.4	1n	"	"	854
37.85*	1	"	"	859.9
37.01	1	"	"	868.4
36.30	1n	"	"	875.6
35.92	1	"	"	879.5
34.9	1b	"	"	890
33.99	1	"	"	899.1
33.69	1	"	"	902.2
33.50	1n	"	"	904.1
32.75	1	"	"	911.7
32.32	1n	"	"	916.1
32.07	1	"	"	918.7
31.72	1n	"	"	922.2
31.42	1n	"	"	925.3
30.67	2n	"	"	933.0
29.86	2	"	"	949.2
28.88	1n	"	"	951.2
28.20	1n	"	"	958.2
27.75	1n	"	"	962.8
27.35	1	"	"	966.9
26.78	1	"	"	972.7
26.28	2	"	"	977.8
25.03	2	"	"	990.6
24.53	1	"	"	995.7
24.28	1	"	"	998.3
23.82	1	"	"	32003.0
23.70	1	"	"	004.2
22.8	1n	"	"	013.5
22.43	1n	"	"	017.2
21.97	1n	"	"	022.0
21.49	1	"	"	026.9
21.15	1	"	"	030.4
20.97	1	"	"	032.1
20.77	1n	"	"	034.4
20.25	1n	"	"	039.6
19.99	1n	"	"	042.3
19.42	2	"	"	048.2
19.13	1n	"	"	051.1
18.88	1n	"	"	053.7
18.51	1n	"	"	057.5
18.13	1	"	"	061.3
17.75	1	"	"	065.8
17.14	1	"	"	071.6
16.83	1	"	"	074.8
16.53	1	"	"	077.9
16.02	2	"	"	083.0

\* Pb?



URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3115.12	1	0.88	9.1	32092.4
14.75	1	"	9.2	096.1
14.42	1n	"	"	099.5
13.75	1	"	"	106.4
13.16	1	"	"	112.5
12.50	1n	"	"	119.3
12.35	1n	"	"	120.9
11.76	1	"	"	127.0
11.52	1	"	"	129.5
10.96	1	"	"	135.2
10.65	1	"	"	138.4
10.3	1n	"	"	142
09.9	1n	"	"	146
09.4	1n	"	"	151
08.79	1n	"	"	157.6
08.43	1n	"	"	161.4
08.07	1n	"	"	165.1
07.79	1n	"	"	168.0
07.65	1n	"	"	169.5
07.47	1n	"	"	171.3
06.9	1b	"	"	177
06.42	1	"	"	180.2
06.29	1	"	"	183.6
05.73	1	"	"	189.4
05.50	1	"	"	191.7
05.20	1	"	"	194.8
04.8	1b	"	"	199
04.27	2	"	"	204.5
03.87	1	"	"	208.7
03.10	1	"	"	216.7
02.70	1n	"	"	220.8
02.55	1	"	"	222.4
01.85	1n	0.87	"	229.7
01.05	1n	"	"	237.9
00.97	1n	"	"	239.8
00.23	1n	"	"	246.5
3099.9	1n	"	"	250
99.4	1n	"	"	255
99.2	1n	"	"	257
98.88	1	"	"	260.5
98.77	1	"	"	261.7
98.15	1	"	"	268.1
97.00	1	"	"	280.1
96.70	1	"	"	283.2
95.97	1	"	"	290.9
95.85	1	"	"	292.1
95.33	1	"	"	297.5
95.15	1	"	"	299.3
94.92	1	"	"	301.8
94.57	1	"	"	305.4
93.97	1	"	"	311.7
93.51	1	"	"	316.5
93.15	2	"	"	320.3
91.7	1b	"	"	335.5
91.4	1b	"	"	339

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
3090.70	1n	0.87	9.2	32346.0
90.45	1n	"	"	348.5
89.98	1n	"	"	353.5
89.10	l	"	"	362.7
88.68	1n	"	"	367.1
88.05	l	"	"	373.7
87.80	l	"	"	376.3
87.23	l	"	"	381.3
86.90	l	"	"	385.8
86.13	1n	"	"	393.8
85.60	1n	"	"	399.3
84.8	1b	"	"	408
84.37	l	"	"	412.3
83.75	1n	"	9.3	418.8
83.2	1b	"	"	424.5
82.7	1b	"	"	430
82.14	l	"	"	435.7
81.18	l	"	"	445.8
80.83	l	"	"	449.5
80.10	l	"	"	457.2
79.40	1n	"	"	464.5
79.05	1n	"	"	468.1
78.55	1n	"	"	473.5
77.95	1n	"	"	479.9
77.7	1n	"	"	482.5
77.50	1n	"	"	484.6
76.7	1b	"	"	493.1
76.2	1b	"	"	498
75.93	l	"	"	512
75.60	l	"	"	505.7
75.15	l	"	"	509.4
74.62	1n	"	"	515.1
74.47	1n	"	"	516.7
73.93	l	"	"	522.3
73.60	l	"	"	526.8
73.3	1b	"	"	529
72.91	2	"	"	533.2
72.47	l	"	"	537.8
71.87	l	"	"	549.2
71.6	1b	"	"	548
71.17	l	"	"	551.6
70.80	l	"	"	555.5
70.40	l	"	"	558.8
69.6	1b	"	"	569
69.3	1b	"	"	571
68.74	l	"	"	577.4
67.85	1n	"	"	586.8
67.37	l	"	"	591.9
67.00	l	"	"	595.8
66.43	l	"	"	601.9
65.8	1b	"	"	609
65.4	1b	"	"	612
65.02	l	"	"	616.9
64.70	l	"	"	620.3
64.30	l	"	"	624.6

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3063.98	1	0.87	9.3	32628.0
63.62	1	"	"	631.8
63.25	1n	"	"	635.8
62.97	1	0.86	"	638.7
62.62	1	"	"	642.5
62.23	1d	"	"	646.6
61.74	1	"	"	649.3
61.30	1n	"	"	656.9
60.80	1	"	"	661.9
60.15	1	"	"	668.8
59.68	1	"	"	673.9
59.3	1n	"	"	678
59.1	1n	"	"	680
58.05	2r	"	"	691.3
57.35	1n	"	"	698.8
56.83	1	"	"	703.3
55.99	1	"	"	713.3
55.71	1	"	"	716.3
55.18	1	"	"	722.0
54.86	1	"	"	725.3
54.5	1b	"	"	729
53.42	1	"	9.4	740.4
52.96	1	"	"	745.7
52.56	1	"	"	750.0
52.00	1	"	"	756.0
51.43	1	"	"	761.9
51.20	1	"	"	764.6
50.61	1d	"	"	771.0
50.30	1	"	"	774.3
49.9	1b	"	"	778.5
49.05	1n	"	"	787.7
48.75	1	"	"	791.0
48.45	1	"	"	794.2
47.98	1	"	"	799.2
47.66	1	"	"	802.8
46.96	1	"	"	810.2
46.6	1	"	"	814
45.55	1	"	"	825.4
45.1	1n	"	"	830
44.26	2	"	"	839.3
44.1	1n	"	"	841
43.3	1b	"	"	850
42.85	1n	"	"	854.5
42.0	1b	"	"	864
41.3	1b	"	"	871
40.6	1b	"	"	881
40.00	1	"	"	885.3
39.3	1n	"	"	893
38.58	1n	"	"	900.7
38.01	2	"	"	906.9
37.63	1n	"	"	910.9
37.38	1n	"	"	913.7
36.7	1n	"	"	921
36.53	1n	"	"	923.0
36.05	1	"	"	928.1

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
3035.60	1	0.86	9.4	32933.0
34.50	1	"	"	945.5
34.15	1	"	"	948.8
33.86	1	"	"	952.0
33.52	1	"	"	955.6
33.27	1	"	"	958.3
32.52	1	"	"	966.4
32.09	1	"	"	971.1
31.65	1n	"	"	975.4
30.9	1b	"	"	984
30.45	1	"	"	989.0
29.52	1	"	"	999.2
29.23	1	"	"	33003.4
28.7	1n	"	"	008
28.48	1	"	"	010.5
28.33	1	"	"	012.1
27.77	1	"	"	018.2
26.99	1n	"	"	026.7
26.77	1	"	"	029.1
26.55	1n	"	"	031.5
26.25	1	"	9.5	045.6
25.16	1	"	"	046.6
24.57	2	"	"	053.1
23.9	1n	"	"	060
23.4	1n	"	"	066
22.94	1	0.85	"	070.9
22.58	1	"	"	074.9
22.31	2	"	"	077.8
21.68	1	"	"	084.7
21.30	1	"	"	087.8
21.02	1	"	"	091.9
20.71	1	"	"	095.3
20.35	1	"	"	099.3
19.9	1b	"	"	104
19.40	1	"	"	109.6
18.95	1	"	"	114.6
18.68	1	"	"	117.6
18.2	1b	"	"	123
17.50	1n	"	"	133.5
17.05	1	"	"	135.5
16.50	1	"	"	141.5
16.16	1	"	"	145.2
15.78	1	"	"	149.4
15.03	1	"	"	157.7
14.35	1n	"	"	165.1
13.96	1	"	"	169.4
13.60	1	"	"	173.4
13.49	1	"	"	174.6
13.08	1	"	"	179.1
12.83	1	"	"	179.9
12.22	1	"	"	188.6
12.04	1	"	"	190.6
11.66	1	"	"	194.7
11.30	1	"	"	198.7
10.87	1	"	"	203.4



URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3010.49	l	0.85	9.5	33207.6
09.80	l	"	"	215.3
09.51	l	"	"	218.6
09.00	l	"	"	224.1
08.29	l	"	"	232.0
08.02	l	"	"	235.0
06.95	l	"	"	246.7
06.2	lb	"	"	255
05.65	l	"	"	261.2
05.23	l	"	"	265.8
04.9	ln	"	"	269.5
04.70	l	"	"	271.6
04.30	l	"	"	276.1
04.1	ln	"	"	278
03.45	l	"	"	285.5
03.17	l	"	"	288.6
02.80	l	"	"	292.7
02.50	l	"	"	296.1
02.15	l	"	"	300.0
01.76	l	"	"	304.3
01.32	l	"	"	309.2
00.90	ln	"	"	313.8
00.26	l	"	"	329.5
2999.28	l	"	"	331.8
99.15	l	"	"	333.3
98.50	ln	"	"	340.5
98.2	ln	"	"	344
97.70	ln	"	"	349.4
97.48	ln	"	9.6	351.5
97.15	ln	"	"	355.5
96.90	ln	"	"	358.2
96.50	l	"	"	362.7
96.2	ln	"	"	366
95.9	ln	"	"	369
95.6	ln	"	"	373
95.00	ld	"	"	379.4
94.57	l	"	"	384.3
93.80	l	"	"	392.8
93.46	l	"	"	396.6
92.85	l	"	"	403.4
91.8	lb	"	"	415
91.10	ln	"	"	422.9
90.65	ln	"	"	428.6
90.1	lb	"	"	434
89.85	l	"	"	437.0
89.51	l	"	"	440.7
88.05	ln	"	"	457.0
87.93	l	"	"	458.5
86.35	ln	"	"	476.1
85.90	l	"	"	481.1
85.24	l	"	"	488.6
84.74	l	"	"	494.1
84.19	l	"	"	490.3
83.85	l	"	"	504.1
83.60	l	"	"	507.0

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2982.89	1	0.84	9.6	33514.7
82.40	1n	"	"	520.4
81.95	1n	"	"	525.5
81.3	1n	"	"	533
81.18	1	"	"	534.2
80.80	1n	"	"	538.4
80.46	1	"	"	542.3
79.31	1	"	"	555.2
78.30	1	"	"	566.6
77.95	1n	"	"	570.5
77.41	1	"	"	576.7
76.46	1n	"	"	587.3
75.97	1	"	"	592.9
75.73	1	"	"	595.6
75.25	1	"	"	601.1
75.0	1b	"	"	604
74.2	1b	"	"	613
73.40	1	"	"	621.9
73.20	1	"	"	624.2
72.75	1n	"	"	628.3
72.3	1b	"	"	634
71.72	1n	"	"	641.0
71.17	2	"	"	647.2
70.90	1	"	9.7	650.1
70.56	1	"	"	654.0
69.85	1n	"	"	662.1
69.6	1n	"	"	665
69.35	1n	"	"	667.7
68.68	1n	"	"	675.3
68.45	1n	"	"	677.9
68.02	1	"	"	682.9
66.77	1	"	"	697.1
66.26	1	"	"	702.8
65.8	1n	"	"	708
65.5	1n	"	"	713.4
65.17	1	"	"	715.2
64.76	1	"	"	719.9
64.35	1	"	"	724.5
63.70	1	"	"	731.9
63.30	1	"	"	736.5
62.87	1	"	"	741.4
61.28	1	"	"	759.6
61.02	1	"	"	762.4
60.38	1n	"	"	769.8
59.96	1	"	"	774.4
59.20	1n	"	"	783.2
58.25	1n	"	"	794.1
57.85	1n	"	"	798.7
57.3	1n	"	"	805
56.85	1	"	"	810.1
56.46	1	"	"	814.6
56.15	2	"	"	818.1
55.73	1	"	"	822.9
55.20	1	"	"	829.0
54.92	2	"	"	832.2

## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2954.46	1	0.84	9.7	33837.4
53.9	1b	"	"	844
53.45	1n	"	"	849.0
53.0	1n	"	"	854
52.85	1n	"	"	856.1
52.46	1	"	"	860.1
52.00	1	"	"	865.6
51.67	1	"	"	869.4
51.45	1	"	"	871.9
51.16	1	"	"	875.3
50.93	1	"	"	877.9
50.62	1	"	"	881.5
50.37	1	"	"	884.4
50.04	1	"	"	888.2
49.64	1n	"	"	892.8
49.03	1	"	"	899.8
48.56	1	"	"	905.2
48.12	1n	"	"	910.2
47.52	1	"	"	917.1
46.8	1b	"	"	925
46.38	1n	"	"	930.3
45.92	1	"	"	935.6
44.73	1n	"	9.8	949.2
44.62	1	"	"	950.5
44.22	1	"	"	955.1
43.93	2	"	"	958.8
43.50	1	"	"	963.9
43.25	1	"	"	966.3
42.90	1d	0.83	"	970.3
42.13	1	"	"	978.8
41.95	2	"	"	981.2
41.35	1n	"	"	988.2
40.80	1	"	"	994.5
40.39	2	"	"	999.3
40.02	1	"	"	34003.6
39.50	1	"	"	009.6
38.95	1	"	"	015.9
38.60	1n	"	"	020.0
38.1	1b	"	"	026
37.40	1	"	"	033.9
37.23	1n	"	"	035.9
37.00	1n	"	"	038.5
36.85*	1n	"	"	040.4
36.46	1	"	"	044.9
35.60	1n	"	"	054.8
35.0	1b	"	"	062
34.5	1b	"	"	068
33.86	1	"	"	075.0
33.65	1	"	"	077.4
33.33	1n	"	"	081.1
33.03	1	"	"	084.6
32.65	1	"	"	089.0
32.23	1	"	"	093.9

\* Mg?

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
2931.90	1	0.83	9.8	34097.8
31.60	1	"	"	101.3
31.45	1	"	"	103.0
30.87	1	"	"	109.8
30.68	1	"	"	112.0
30.47	1	"	"	114.4
29.85	1	"	"	121.7
29.70	1	"	"	123.3
29.16	1	"	"	129.7
28.61	1	"	"	136.2
28.16	1	"	"	141.3
27.77	1	"	"	145.9
27.45	1	"	"	149.6
27.30	1	"	"	151.4
26.64	1	"	"	159.1
26.42	1	"	"	161.7
26.18	1	"	"	164.5
26.00	1	"	"	166.5
25.61	1	"	"	182.8
25.25	1	"	"	175.3
24.62	1	"	"	182.7
23.52	1n	"	"	195.6
23.20	1	"	"	199.3
22.90	1	"	"	202.8
22.71	1	"	"	205.0
22.23	1	"	"	210.6
22.10	1	"	"	212.2
21.76	1	"	"	216.2
21.15	1	"	9.9	223.2
20.77	1	"	"	227.6
20.46	1	"	"	231.3
20.23	1	"	"	234.0
20.00	1	"	"	236.7
19.50	1n	"	"	242.5
19.08	1	"	"	247.5
18.98	1	"	"	248.6
18.73	1	"	"	251.6
18.48	1n	"	"	254.5
17.8	1b	"	"	262.5
17.2	1b	"	"	269.5
16.90	1n	"	"	273.1
16.54	1	"	"	277.3
15.80	1n	"	"	286.0
15.57*	1	"	"	288.7
15.32	1	"	"	291.7
14.82	1	"	"	297.6
14.69	1	"	"	298.1
14.30	1	"	"	303.7
14.03	1	"	"	306.8
13.50	1	"	"	313.1
12.83	1	"	"	320.0
12.65	1	"	"	323.1
11.90	1	"	"	331.9

\* Mg?



URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2911.60	1	0.83	9.9	34335.5
11.22	1	"	"	340.0
10.88	1	"	"	344.0
10.75	1n	"	"	345.5
10.3	1b	"	"	351
09.78	1n	"	"	357.0
09.30	1	"	"	362.6
08.8	1b	"	"	368.5
08.31	3	"	"	374.3
07.65	1nd	"	"	382.1
07.00	1n	"	"	389.8
06.85	2	"	"	391.6
05.8	1b	"	"	404
05.32	1	"	"	409.7
04.52	2n	"	"	419.2
04.07	1	"	"	424.6
03.63	1	0.82	"	429.7
03.08	1	"	"	436.3
02.50	1	"	"	443.2
02.1	1b	"	"	448
01.70	1	"	"	451.7
01.27	1	"	"	457.9
00.22	1n	"	"	470.2
2899.65	1n	"	"	477.1
98.80	1	"	"	487.1
98.12	1n	"	"	491.2
97.70	1	"	"	499.2
97.45	1	"	"	503.2
97.00	1n	"	10.0	508.5
96.77	1	"	"	511.2
96.52	1	"	"	514.2
96.15	1n	"	"	517.4
95.96	1	"	"	520.9
95.60	1n	"	"	525.1
95.30	1	"	"	528.7
94.98	1	"	"	532.5
94.60	1	"	"	537.1
94.20	1	"	"	541.9
93.80	1n	"	"	546.6
93.5	1b	"	"	550
92.70	1	"	"	559.8
92.25	1	"	"	565.1
91.80	1n	"	"	570.5
91.10	1	"	"	578.9
90.82	1	"	"	582.3
90.50	1	"	"	586.1
90.15	1	"	"	590.3
89.65	2	"	"	596.8
89.32	1	"	"	600.2
89.12	1	"	"	602.7
88.76	1	"	"	606.9
88.42	1	"	"	611.0
88.28	1	"	"	612.7
87.97	1	"	"	616.4
87.65	1	"	"	620.2

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3287.31	I	0.92	8.6	30624.3
87.00	I	"	"	628.0
86.87	I	"	"	629.6
86.50	I	"	"	634.0
86.10	I	"	"	638.8
85.70	I	"	"	643.6
85.49	I	"	"	646.2
85.28	I	"	"	649.9
85.05	I	"	"	651.4
84.70	ln	"	"	655.6
84.43	ln	"	"	658.9
83.87	ln	"	"	665.7
83.50	ln	"	"	670.1
83.00	I	"	"	676.1
82.82	I	"	"	678.3
82.00	ln	"	"	688.1
81.67	I	"	"	692.2
81.1	ln	"	"	699
80.50	I	"	"	706.2
80.28	I	"	"	708.7
80.00	I	"	"	712.2
79.70	I	"	"	715.8
78.95	ln	"	"	724.9
78.3	lb	"	"	723
77.86	I	"	"	738.0
77.65	ln	"	"	740.6
77.10	I	"	"	747.2
76.55	ln	"	"	753.9
75.9	lb	"	"	762
75.24	I	"	"	769.7
74.81	ln	"	"	774.9
74.16	I	"	"	782.8
73.75	ln	"	"	787.7
73.60	ln	"	"	789.6
73.35	ln	"	"	792.6
73.1	lb	"	10.1	796
72.53	I	"	"	802.4
72.15	I	"	"	807.0
71.30	I	"	"	817.3
71.04	I	"	"	820.5
70.80	ln	"	"	823.4
70.4	lb	"	"	828
69.49	I	"	"	839.3
69.00	I	"	"	845.2
68.87	I	"	"	846.8
68.51	I	"	"	851.2
68.20	ln	"	"	855.0
67.89	ln	"	"	858.7
67.45	I	"	"	867.7
67.15	ln	"	"	864.1
66.90	ln	"	"	870.8
66.47	I	"	"	876.0
66.22	ln	"	"	879.1
65.73	2	"	"	884.0
65.40	I	"	"	889.0

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
3265.20	1	0.92	10.1	30891.5
64.95	1	0.81		894.5
64.70	1	"	"	897.6
64.35	1	"	"	901.8
64.18	1	"	"	903.4
63.65	1n	"	"	910.4
63.28	1	"	"	914.9
62.90	1n	"	"	919.5
62.72	1n	"	"	921.7
62.45	1n	"	"	925.0
61.8	1b	"	"	934
61.31	1	"	"	938.9
60.86	1	"	"	944.4
60.53	1	"	"	948.5
59.85	2	"	"	956.8
59.36	1	"	"	962.8
58.95	2	"	"	967.8
58.40	1n	"	"	974.5
58.25	1n	"	"	976.4
57.53	1n	"	"	985.2
57.15	1n	"	"	987.8
56.63	1	"	"	996.2
56.30	1n	"	"	35000.2
56.05	1	"	"	003.3
55.67	1	"	"	008.0
55.00	1	"	"	016.1
54.55	1	"	"	021.7
54.30	1	"	"	024.8
53.90	1d	"	"	030.7
53.60	1	"	"	033.3
53.50	1	"	"	034.6
53.07	1	"	"	034.9
52.83	1	"	"	042.8
52.50	1	"	"	046.9
52.20*	1	"	"	050.5
51.90	1	"	"	054.2
51.35	1n	"	"	061.0
50.95	1	"	"	065.9
50.57	1	"	"	070.6
50.0	1n	"	"	078
49.8	1n	"	"	080
49.55	1	"	"	078.2
49.26	1	"	"	086.8
49.00	1	"	"	089.9
48.75	1n	"	"	093.0
48.35	1	"	10.2	097.8
48.12	1	"	"	100.7
47.83	1	"	"	104.3
47.50	1n	"	"	108.3
46.95	1	"	"	114.8
46.70	1	"	"	118.2
46.44	1	"	"	121.4
46.21	1	"	"	124.2

\* Mg?

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuum
		$\lambda +$	$\frac{1}{\lambda} -$	
3246.00	1	0.81	10.2	35126.8
45.70	1n	"	"	130.5
45.43	1n	"	"	133.9
45.10	1	"	"	138.0
44.78	1	"	"	141.9
44.60	1n	"	"	144.1
43.95	1n	"	"	152.2
42.98	1	"	"	164.2
42.60	1	"	"	168.8
42.30	1	"	"	172.6
42.20	1	"	"	173.8
41.48	1	"	"	182.8
41.25	1	"	"	185.6
40.78	1	"	"	191.4
40.60	1	"	"	193.7
40.00	1	"	"	201.1
39.2	1b	"	"	211.0
38.73	1	"	"	216.8
38.40	1n	"	"	220.9
38.10	1	"	"	224.6
37.86	1	"	"	227.7
37.40	1	"	"	233.3
37.31	1	"	"	234.5
37.00	2	"	"	238.3
36.1	1nd	"	"	248.5
35.88	1	"	"	252.3
35.68	1	"	"	254.8
34.82	1	"	"	265.5
34.70	1	"	"	266.9
34.2	1b	"	"	273
33.90	1	"	"	276.9
33.35	1n	"	"	283.7
32.75	1	"	"	291.2
32.53	1	"	"	293.9
32.16	2	"	"	298.5
31.7	1b	"	"	304
31.05	1n	"	"	312.4
30.5	1n	"	"	319
29.96	1n	"	"	326.0
29.4	1b	"	"	333
29.00	1	"	"	338.0
28.1	1b	"	"	349
27.90	1n	"	"	351.7
27.47	1	"	"	357.1
27.05	1	"	"	362.4
26.77	1	"	"	365.9
26.60	1	"	"	368.0
26.28	1	"	"	372.0
25.90	1	"	"	376.7
25.65	1	"	"	379.9
25.5	1n	"	"	382
24.95	1	0.80	"	388.7
24.70	1	"	"	391.8
24.45	1	"	"	394.9
23.65	1	"	10.3	404.9



URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuum
		$\lambda +$	$\frac{1}{\lambda}$	
3223·24	1	0·80	10·3	35410·0
22·80	1	"	"	415·5
22·63	1	"	"	417·7
22·27	1	"	"	422·2
22·08	1	"	"	426·6
21·48	1	"	"	432·1
21·20	2	"	"	435·6
20·75	1n	"	"	441·3
20·57	1	"	"	443·5
20·34	1	"	"	446·4
19·89	1	"	"	452·1
19·26	1n	"	"	460·0
19·06	1	"	"	461·5
18·85	1	"	"	465·2
18·70	1	"	"	467·0
18·43	1	"	"	470·5
18·05	2	"	"	475·2
17·75	1	"	"	479·0
17·3	1b	"	"	485
17·00	1	"	"	488·5
16·88	1	"	"	490·0
16·52	1	"	"	494·5
16·15	1n	"	"	499·2
16·05	1n	"	"	500·4
15·85	1	"	"	503·0
15·30	1	"	"	509·9
15·18	1	"	"	511·4
14·90	1	"	"	514·9
14·73	1n	"	"	517·1
14·12	1n	"	"	524·8
13·9	1n	"	"	527·5
13·7	1n	"	"	529
13·4	1n	"	"	534
13·10	1	"	"	537·6
12·8	1b	"	"	542
12·32	1n	"	"	547·5
11·8	1n	"	"	554
11·49	1	"	"	558·0
11·2	1n	"	"	562
10·87	1n	"	"	565·9
10·50	1	"	"	570·6
10·05	1	"	"	576·3
09·70	1	"	"	580·7
09·08	1	"	"	588·5
08·66	1	"	"	593·9
08·50	1	"	"	595·9
07·20	1	"	"	612·4
06·80	1	"	"	617·5
06·4	1nd	"	"	622·5
05·79	1	"	"	630·3
05·33	1	"	"	636·1
04·10	1	"	"	651·7
03·90	1	"	"	654·3
03·07	1	"	"	664·9
02·65	2	"	"	670·2

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3202.30	1	0.80	10.3	35674.2
01.75	1	"	"	681.7
01.43	1	"	"	685.8
00.93	1	"	"	692.1
00.42	1n	"	"	698.6
00.22	1n	"	"	701.2
2799.8	1b	"	"	706.5
99.2	1b	"	10.4	714
98.28	1	"	"	725.8
97.87	1	"	"	731.1
97.45	1n	"	"	736.4
97.25	1n	"	"	739.0
96.80	1	"	"	744.7
96.1	1b	"	"	754
95.65*	1	"	"	759.5
95.30	2	"	"	763.9
95.00	1	"	"	767.8
94.50	1n	"	"	774.1
94.05	2	"	"	779.9
93.54	1	"	"	786.5
92.15	1n	"	"	804.3
91.4	1n	"	"	814
91.16	1	"	"	817.0
90.78	1n	"	"	821.9
90.4	1b	"	"	827
89.9	1b	"	"	833
89.2	1b	"	"	842
88.7	1b	"	"	849
88.24	1	"	"	854.5
87.45	1	"	"	864.7
86.9	1b	"	"	872
86.27	1n	"	"	879.9
86.0	1n	"	"	883
85.76	1n	"	"	886.5
85.50	1	"	"	889.7
85.30	1	"	"	892.4
85.02	1	"	"	896.0
84.77	1	"	"	899.2
84.57	1	"	"	901.2
84.12	1	"	"	907.8
83.99	1	0.79	"	909.4
83.55	1n	"	"	915.0
83.33	1n	"	"	917.8
82.52	1n	"	"	928.3
82.22	1	"	"	932.1
81.90	1	"	"	936.2
81.67	1	"	"	939.2
81.52	1	"	"	941.2
81.16	i	"	"	945.8
80.89	1n	"	"	949.3
80.13	1	"	"	959.1
79.53	1n	"	"	966.9
79.05	1n	"	"	973.1

\* Mg?

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2778.35	1	0.79	10.4	35982.2
77.27	1	"	"	998.1
76.66	1	"	"	36004.1
76.45	1n	"	"	006.8
75.95	1n	"	"	013.3
75.60	1	"	10.5	017.8
75.50	1	"	"	019.1
75.37	1	"	"	020.9
75.16	1	"	"	023.5
74.88	1	"	"	027.1
74.54	1	"	"	031.5
74.25	1	"	"	035.3
73.90	1	"	"	039.8
73.74	1	"	"	042.0
73.20	1	"	"	048.9
72.75	1	"	"	054.8
72.45	1	"	"	058.7
72.33	1	"	"	060.3
72.02	1	"	"	064.3
71.69	1	"	"	068.6
71.35	1n	"	"	072.9
70.85	1	"	"	079.5
70.41	1	"	"	085.3
70.15	1	"	"	088.6
69.56	1	"	"	096.3
69.40	1	"	"	098.4
69.17	1	"	"	101.4
68.95	1	"	"	104.3
68.53	1	"	"	109.8
68.30	1	"	"	113.9
67.85	1	"	"	118.7
67.52	1n	"	"	122.9
66.97	1	"	"	130.1
66.26	1	"	"	139.4
66.00	1	"	"	142.8
65.78	1	"	"	145.7
65.50	1	"	"	149.1
65.3	1br	"	"	153
64.80	1	"	"	158.5
64.35	1	"	"	164.4
63.82	1n	"	"	171.4
63.57	1	"	"	174.6
62.98	1	"	"	182.3
62.50	1n	"	"	188.6
61.90	1d	"	"	196.4
61.55	1	"	"	201.1
61.33	1	"	"	203.9
60.46	1	"	"	215.4
59.30	1	"	"	222.7
59.05	1	"	"	233.9
58.62	1	"	"	239.5
58.53	1	"	"	240.7
58.26	1	"	"	244.3
58.03	1	"	"	246.3
57.93	1	"	"	248.6

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuum
		$\lambda +$	$\frac{1}{\lambda} -$	
2757.65	1	0.79	10.5	36252.3
57.40	1	"	"	255.5
57.25	1	"	"	257.5
56.40	1	"	"	268.7
55.26	1	"	"	283.7
55.06	1	"	"	286.3
54.70	1d	"	"	291.0
54.27	2	"	"	296.8
53.87	1	"	"	301.8
53.52	1	"	"	306.7
53.42	1	"	"	308.0
53.09	1	"	"	312.3
52.57	1	"	"	319.2
52.03	2	"	"	326.3
51.32	1	"	10.6	335.6
50.95	1	"	"	340.5
50.69	1	"	"	343.9
50.50	1	"	"	346.5
50.23	1	"	"	350.0
50.05	1	"	"	352.4
48.98	1	"	"	366.5
48.60	1	"	"	371.6
48.03	1	"	"	379.1
47.47	1	"	"	386.5
47.26	1	"	"	389.3
46.82	1	"	"	395.1
46.27	1	"	"	402.4
45.99	1	"	"	406.1
45.22	1	"	"	416.3
44.95	1	"	"	419.9
44.50	1	"	"	425.9
44.38	1	"	"	427.5
43.79	1	"	"	435.4
43.50	2	"	"	439.2
43.32	1	"	"	441.6
42.70	1	"	"	449.8
42.18	1	"	"	456.7
41.88	1	0.78	"	460.8
41.70	1	"	"	463.1
41.34	1	"	"	467.9
41.19	1	"	"	469.9
40.94	1	"	"	473.2
40.63	1	"	"	477.4
40.40	1	"	"	480.4
39.50	1	"	"	492.4
39.08	1	"	"	498.0
38.65	1	"	"	503.8
38.50	1	"	"	505.8
38.23	1	"	"	509.3
37.93	1	"	"	513.3
37.75	1	"	"	515.7
37.19	1	"	"	523.2
36.45	1	"	"	533.1
36.10	1	"	"	537.8
35.86	1	"	"	541.0



URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2735.65	1	0.78	10.6	36543.8
35.42	1	"	"	546.9
35.05	1	"	"	551.8
34.80	1	"	"	555.1
34.34	1	"	"	561.3
34.04	1	"	"	565.3
33.85	1n	"	"	567.8
33.41	1n	"	"	573.8
33.06	1	"	"	578.4
32.60	1br	"	"	584.6
32.15	1n	"	"	590.6
31.52	1	"	"	599.1
31.38	1	"	"	600.9
30.90	1n	"	"	606.2
30.43	1	"	"	613.7
30.20	1	"	"	616.7
29.75	1d	"	"	622.8
29.35	1	"	"	628.2
29.15	1	"	"	630.9
28.8	1n	"	"	635.5
28.65	1n	"	"	637.6
28.3	1br	"	"	642
27.65	1	"	"	651.0
27.40	1	"	"	654.3
26.75	1n	"	10.7	663.1
26.61	1	"	"	664.9
26.01	1	"	"	673.0
25.78	1	"	"	676.1
25.56	1	"	"	679.0
25.14	1	"	"	684.7
24.55	1n	"	"	692.6
24.2	1br	"	"	697
23.90	1	"	"	701.4
23.80	1	"	"	702.7
23.43	1	"	"	707.7
23.25	1	"	"	710.1
22.90	1	"	"	714.8
21.95	1n	"	"	727.7
21.53	1	"	"	734.3
21.25	1	"	"	737.1
20.99	1	"	"	740.6
20.78	1	"	"	743.5
20.50	1	"	"	747.2
20.33	1	"	"	749.6
20.00	1	"	"	754.0
19.63	1	"	"	759.1
19.43	1	"	"	761.7
19.15	1	"	"	765.5
19.00	1	"	"	767.5
18.72	1	"	"	771.3
18.18	1	"	"	778.6
17.65	1	"	"	785.8
17.25	1n	"	"	791.2
17.10	1n	"	"	793.2
16.63	1	"	"	799.6

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2716.48	1	0.78	10.7	36801.6
16.20	1	"	"	805.4
16.09	1	"	"	806.9
15.66	1	"	"	812.8
15.40	1n	"	"	816.3
15.10	1	"	"	820.3
14.68	1	"	"	826.1
14.40	1	"	"	829.8
14.04	1	"	"	835.7
13.57	2	"	"	841.1
13.33	1n	"	"	844.4
12.68	1n	"	"	853.2
12.20	1	"	"	859.8
11.86	1	"	"	864.4
11.64	1	"	"	867.4
11.23	1	"	"	872.7
10.70	1n	"	"	880.1
10.20	1n	"	"	886.9
09.63	1	"	"	894.7
09.12	1	"	"	901.7
08.60	1	"	"	908.7
08.45	1	"	"	910.8
08.05	1	"	"	916.2
07.79	1	"	"	919.8
07.59	1	"	"	922.5
07.09	2	"	"	929.3
06.85	1	"	"	932.5
06.6	1br	"	"	936
06.3	1br	"	"	940
05.87	1	"	"	946.0
05.33	1	"	"	953.4
04.90	2n	"	"	959.2
04.2	1br	"	"	969
03.83	1n	"	10.8	973.9
02.9	1br	"	"	985
01.95	1	"	"	999.5
01.68	1	"	"	37003.2
01.50	1	"	"	005.6
01.08	1	"	"	011.4
00.38	1	"	"	021.0
2699.75	1	"	"	029.7
99.46	1	0.77	"	033.7
98.57	2	"	"	045.9
98.15	3	"	"	051.6
97.52	1	"	"	060.2
97.15	1	"	"	065.3
96.68	1	"	"	071.9
96.40	1	"	"	075.8
96.00	1	"	"	081.2
95.60	2	"	"	096.7
94.35	1	"	"	101.2
93.88	2	"	"	110.5
93.41	2	"	"	116.9
92.49	2	"	"	129.5
91.93	1n	"	"	137.3

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2691.17	2	0.78	10.8	37147.8
90.65	1	"	"	155.0
90.15	1	"	"	161.9
89.23	1	"	"	174.6
88.76	1	"	"	181.1
88.07	1	"	"	191.3
87.55	1n	"	"	197.8
86.9	1br	"	"	207
86.06	2	"	"	218.5
85.7	1n	"	"	223
84.70	1	"	"	237.2
84.40	1	"	"	241.5
84.17	1	"	"	244.6
83.40	2	"	"	255.4
82.40	2n	"	"	269.2
81.80	1	"	"	277.6
81.23	1n	"	"	285.5
80.75	1	"	"	292.2
80.3	1n	"	"	298.5
80.0	1n	"	"	303
79.1	1n	"	10.9	316
78.96	1	"	"	317.1
78.53	1	"	"	323.0
78.14	1	"	"	328.5
77.68	1	"	"	335.0
77.25	1	"	"	340.9
76.75	1	"	"	347.8
76.50	2	"	"	351.3
76.00	1	"	"	358.3
75.18	2di	"	"	369.8
74.63	1n	"	"	377.5
74.10	1n	"	"	384.9
73.73	1	"	"	390.1
73.51	1	"	"	393.1
73.25	1	"	"	396.8
72.80	1	"	"	403.0
72.38	1	"	"	408.9
72.08	1	"	"	413.1
71.40	1	"	"	423.7
70.99	1	"	"	428.4
70.65	1n	"	"	433.2
70.50	1n	"	"	438.2
69.9	1n	"	"	444
69.31	2	"	"	452.0
69.02	1	"	"	456.0
68.28	1	"	"	466.5
68.11	1	"	"	468.8
67.25	1n	"	"	480.9
66.6	2br	"	"	490
65.96	1	"	"	499.0
65.76	1	"	"	501.9
64.24	2	"	"	513.6
63.95	1	"	"	527.3
63.5	1br	"	"	534

URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2663.3*	lbr	0.78	10.9	37536.5
62.90	l	"	"	542.1
62.2	lbr	"	"	552
61.27	l	"	"	565.2
60.23	l	"	"	579.8
60.00	2	"	"	583.1
59.60	l	"	"	588.7
59.19	ln	"	"	594.7
58.85	l	"	"	600.2
58.49	l	"	"	604.9
58.20	l	"	"	608.5
57.96	l	"	"	611.9
57.45	ln	"	"	619.2
57.25	ln	"	"	622.0
56.6	lb	"	"	631
55.5	lb	"	"	647
55.05	ln	"	11.0	653.1
54.70	l	0.76	"	658.0
54.3	lb	"	"	664
54.00	l	"	"	668.0
53.50	l	"	"	675.1
53.20	l	"	"	679.3
52.95	2	"	"	682.9
52.8	ln	"	"	685
52.27	l	"	"	692.6
51.96	l	"	"	697.0
51.40	l	"	"	704.9
50.95	ln	"	"	711.3
50.25	ln	"	"	721.3
49.65	l	"	"	729.8
49.15	2	"	"	737.0
48.84	ln	"	"	741.4
48.3	lb	"	"	749
48.00	ln	"	"	753.3
47.65	ln	"	"	758.3
47.47	ln	"	"	760.9
47.1	lb	"	"	766
46.6	lb	"	"	773
45.54	2	"	"	788.5
44.50	l	"	"	803.3
44.22	l	"	"	807.3
43.62	l	"	"	815.9
43.38	l	"	"	819.4
42.9	ln	"	"	826
42.00	l	"	"	839.1
41.66	l	"	"	844.0
41.2	ln	"	"	851
40.43	l	"	"	861.6
40.00	l	"	"	867.8
39.70	l	"	"	872.1
39.45	l	"	"	875.8
39.10	l	"	"	880.7
38.7	lb	"	"	886



URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2638.4	1b	0.76	11.0	37891
37.82	1	"	"	899.1
37.48	1r	"	"	904.0
37.3	1b	"	"	907
36.33	1n	"	"	920.5
35.91	1	"	"	926.6
35.59	2	"	"	931.2
35.3	1b	"	"	935
34.6	1b	"	"	945
34.2	1b	"	"	951
33.35	1r	"	"	963.4
32.74	1	"	"	972.2
32.50	1	"	"	975.7
32.08	1	"	"	981.8
31.74	1	"	11.1	986.7
31.42	2	"	"	991.3
31.15	2	"	"	995.2
30.7	1b	"	"	38002
29.95	1n	"	"	012.5
29.26	1	"	"	022.5
28.99	1	"	"	026.4
28.57	1	"	"	032.5
28.02	1	"	"	040.5
27.62	2	"	"	046.3
26.70	1	"	"	059.6
25.98	1	"	"	070.0
25.30	1	"	"	079.9
24.99	1	"	"	084.4
23.62	1n	"	"	104.3
22.50	1n	"	"	120.6
21.86	1n	"	"	129.8
21.39	1	"	"	136.6
21.08	1	"	"	141.1
20.80	1	"	"	145.2
20.30	1	"	"	152.5
20.18	1	"	"	154.3
19.37	1	"	"	166.0
18.25	1n	"	"	182.4
17.36	1	"	"	195.3
16.99	1	"	"	200.7
16.13	1	"	"	212.6
15.21	1n	"	"	226.8
14.0	1n	"	"	244
13.35	1n	"	"	254.0
13.00	1	"	"	259.1
12.52	1	"	"	265.2
11.70	1	"	"	278.1
11.23	1	"	"	285.0
10.75	1*	"	"	292.1
10.51	1	"	"	295.6
10.01	1	"	"	302.9
09.82	1	0.75	"	305.7
09.34	1	"	11.2	312.7
09.13	1	"	"	313.7
08.62	1	"	"	323.3

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
2608.25	1	0.75	11.2	38328.8
07.55	1	"	"	339.0
06.80	1	"	"	350.1
06.60	1	"	"	364.1
06.26	1	"	"	358.0
05.86	1	"	"	363.7
05.48	1	"	"	369.5
04.93	1	"	"	377.6
04.74	1	"	"	380.3
04.37	1	"	"	386.0
04.00	1	"	"	391.3
03.68	1	"	"	396.0
03.50	1	"	"	392.0
03.10	1	"	"	405.5
02.51	1n	"	"	413.3
01.62	2n	"	"	426.4
00.9	1b	"	"	437
00.4	1b	"	"	444
2599.90	1	"	"	451.8
98.95	1	"	"	465.9
97.77	1	"	"	483.4
97.40	1n	"	"	488.8
97.10	1n	"	"	493.2
96.23	1	"	"	506.2
95.71	1	"	"	513.9
95.45	1	"	"	517.8
95.10	1n	"	"	522.9
94.40	1	"	"	532.6
93.9	1n	"	"	541
93.67	1n	"	"	544.3
92.67	1	"	"	559.2
92.2	1b	"	"	566
91.35	2	"	"	578.8
90.90	1	"	"	585.4
90.55	1	"	"	590.7
90.22	1	"	"	595.6
89.70	1	"	"	603.3
89.27	1	"	"	609.8
89.00	1	"	"	613.7
88.65	1n	"	"	619.0
87.9	1nd	"	11.3	630
87.60	1	"	"	634.6
87.16	2	"	"	641.1
86.33	1	"	"	653.5
85.30	1	"	"	668.9
84.9	2b	"	"	675
84.50	1	"	"	680.9
83.5	2b	"	"	686
82.72	1	"	"	707.6
82.23	1	"	"	714.9
81.83	1	"	"	720.9
81.22	2	"	"	730.1
80.67	1	"	"	738.4
79.62	2n	"	"	753.6
79.23	1n	"	"	760.0

## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2578.40	1	0.75	11.3	38772.5
77.46	1	"	"	786.5
77.14	1	"	"	791.4
76.25	1	"	"	804.8
75.53	1	"	"	815.7
75.3	1n	"	"	819
74.8	1b	"	"	827
73.3	1n	"	"	849
73.04	1n	"	"	853.2
72.73	2	"	"	857.9
72.43	2	"	"	862.5
71.90	1	"	"	870.5
71.60	1	"	"	874.9
71.16	1	"	"	881.7
70.77	1	"	"	887.4
70.43	1	"	"	892.7
69.85	1	"	"	901.5
69.46	1	"	"	907.4
68.95	1d	"	"	915.1
68.05	1	"	"	928.7
67.22	1	"	11.4	941.3
67.00	1	"	"	944.6
66.75	1	"	"	948.4
66.00	1	"	"	959.8
65.52	2	"	"	967.1
64.55	1nd	0.74	"	981.8
64.02	1n	"	"	989.9
63.60	1n	"	"	996.5
63.07	1	"	"	004.3
62.93	1	"	"	006.4
62.68	1	"	"	010.3
62.19	1	"	"	017.7
61.76	1	"	"	024.3
61.03	1	"	"	035.4
60.35	1n	"	"	045.8
60.10	1	"	"	049.6
59.60	1	"	"	057.2
59.30	2	"	"	061.8
58.43	1n	"	"	075.1
58.07	1n	"	"	080.6
57.5	1	"	"	074
57.1	1	"	"	095.2
56.29	2	"	"	107.7
55.95	1n	"	"	113.0
55.62	1n	"	"	118.1
55.27	1n	"	"	123.4
54.9	1n	"	"	129
54.52	1n	"	"	134.9
53.82	1n	"	"	145.7
53.53	1n	"	"	150.1
52.47	1n	"	"	166.3
52.00	1	"	"	173.5
51.55	1	"	"	180.5
51.2	1n	"	"	186
50.9	1nbr	"	"	190

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2550.7	ln	0.74	11.4	38193.5
50.1	ln	"	"	203
49.43	2	"	"	213.1
49.26	1	"	"	215.6
48.40	1	"	11.5	228.8
48.08	1	"	"	233.8
47.74	1	"	"	239.0
47.47	1	"	"	243.2
47.52	ln	"	"	242.4
46.45	ln	"	"	258.9
46.00	1	"	"	39265.8
45.9	ln	"	"	281
45.55	ln	"	"	272.8
45.12	1	"	"	279.4
44.73	1	"	"	285.4
44.45	1	"	"	289.7
44.12	1	"	"	294.8
43.46	ln	"	"	305.0
43.30	ln	"	"	307.5
42.80	1	"	"	315.2
41.95	2	"	"	328.4
41.60	1	"	"	333.8
41.47	1	"	"	335.9
41.14	1	"	"	340.9
40.77	1	"	"	346.7
40.50	1	"	"	350.8
40.40	1	"	"	352.4
39.98	1	"	"	358.9
39.60	1	"	"	364.8
39.38	1	"	"	370.2
39.05	1	"	"	373.3
38.83	1	"	"	376.8
38.51	1	"	"	381.7
38.3	ln	"	"	385
37.80	1	"	"	392.7
37.36	1	"	"	399.6
36.88	1	"	"	407.0
36.70	1	"	"	409.7
36.33	1	"	"	415.6
36.00	1	"	"	420.7
35.65	2	"	"	426.2
35.03	1	"	"	435.8
34.95	1	"	"	437.0
33.32	1	"	"	462.4
33.03	1	"	"	466.9
32.80	ln	"	"	470.5
32.40	1	"	"	476.8
31.88	1	"	"	484.9
31.65	1	"	"	488.5
31.5	ln	"	"	491
30.95	lnd	"	"	499.0
30.38	1	"	"	508.3
30.14	1	"	11.6	511.9
29.60	1	"	"	520.3
29.06	1	"	"	528.8



URANIUM—*continued*.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2528.83	1	0.74	11.6	39532.5
28.65	1	"	"	535.3
28.44	1	"	"	538.5
28.17	1	"	"	542.7
27.80	1	"	"	548.4
27.50	1	"	"	553.2
27.23	1	"	"	557.5
26.62	1	"	"	570.7
26.0	1br	"	"	577
25.46	2	"	"	585.2
25.02	1	"	"	592.0
24.55	1	"	"	599.4
24.4	1	"	"	602
23.98	1	"	"	608.5
23.8	ln	"	"	611
23.1	ln	"	"	622
22.17	1	"	"	636.8
21.9	1	"	"	641
21.45	1	"	"	648.2
20.99	1	"	"	655.4
20.8	ln	"	"	658
20.35	1	"	"	665.5
19.50	ln	"	"	678.7
19.20	1	"	"	683.6
19.05	1	"	"	685.9
18.56	1	"	"	693.8
18.0	ln	"	"	702.5
17.27	ln	0.73	"	714.0
17.06	ln	"	"	717.3
16.20	1	"	"	730.9
15.80	1	"	"	737.2
15.63	1	"	"	739.9
15.20	ld	"	"	746.7
14.86	1	"	"	752.0
14.50	1	"	"	757.7
14.17	2	"	"	763.0
13.8	ln	"	"	769
13.4	ln	"	"	775
12.7	ln	"	"	786
12.29	1	"	"	779.3
12.10	1	"	"	779.6
11.05	ln	"	11.7	812.3
10.97	1	"	"	813.5
10.45	1	"	"	821.8
10.23	1	"	"	825.3
09.60	ln	"	"	835.3
09.23	ln	"	"	841.2
08.45	ln	"	"	853.6
08.02	1	"	"	860.4
07.80	1	"	"	863.9
07.50	1	"	"	868.7
07.18	1	"	"	873.7
07.05	1	"	"	875.8
06.55	ln	"	"	883.8
06.12	1	"	"	890.6

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2305.38	1	0.73	11.7	39902.4
04.7	1nd	"	"	913
04.0	1nd	"	"	924
03.4	1nbr	"	"	934
02.5	1n	"	"	948
02.00	1	"	"	956.3
01.45	1	"	"	965.1
00.95	2	"	"	973.1
2499.68	2n	"	"	993.4
98.90	1	"	"	40005.9
98.35	1	"	"	014.7
97.85	1	"	"	022.7
97.05	2n	"	"	035.6
96.13	1n	"	"	050.3
95.85	1n	"	"	054.8
95.4	1n	"	"	062
94.86	1	"	"	070.7
94.5	1n	"	"	076
94.3	1n	"	"	080
93.8	1b	"	11.8	088
93.00	1	"	"	100.5
92.4	1b	"	"	110
91.43	1n	"	"	125.8
91.03	2	"	"	132.2
90.72	1	"	"	137.2
89.87	1	"	"	150.9
89.33	1	"	"	159.7
89.12	1	"	"	162.0
88.87	1	"	"	167.1
88.63	1	"	"	171.0
88.25	1	"	"	177.1
87.95	1	"	"	181.9
87.70	1	"	"	186.0
87.50	1	"	"	189.9
87.17	1	"	"	194.5
86.83	1	"	"	200.0
86.50	1	"	"	205.4
86.27	1	"	"	209.1
85.85	1	"	"	215.9
85.18	1	"	"	226.7
85.00	1	"	"	229.6
84.72	1	"	"	234.2
84.30	1	"	"	241.0
84.08	1	"	"	244.6
83.88	1	"	"	246.8
83.37	1	"	"	256.1
83.08	1	"	"	260.8
82.75	1	"	"	265.6
82.30	1	"	"	283.3
82.00	1	"	"	278.3
81.60	1n	"	"	284.8
81.10	1n	"	"	292.9
80.73	1	"	"	298.9
80.58	1	"	"	301.4
80.25	1	"	"	306.7

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
2479.67	2	0.73	11.8	40316.1
78.69	3	"	"	332.1
78.10	1n	"	"	341.7
77.88	1	"	"	344.3
77.27	1	"	"	355.2
76.56	2	"	11.9	383.0
75.71	1	"	"	380.6
75.40	1	"	"	385.6
75.1	1b	"	"	390.5
74.26	1	"	"	404.2
73.75	1n	"	"	412.6
73.46	1	"	"	417.3
73.22	1	"	"	421.2
72.98	1	"	"	425.1
72.82	1	"	"	427.8
72.28	1	"	"	436.6
71.22	1	"	"	454.0
70.93	1	"	"	458.7
70.76	1	"	"	461.5
70.52	1	"	"	465.4
69.67	1	0.72	"	479.4
69.55	1	"	"	481.3
69.23	1	"	"	486.6
68.43	1	"	"	499.7
68.35	1	"	"	501.0
67.98	1	"	"	507.1
67.41	1	"	"	516.4
66.80	2b	"	"	526.4
65.93	1	"	"	540.8
65.25	1	"	"	551.9
65.01	1	"	"	555.9
64.13	1n	"	"	570.4
63.87	1n	"	"	573.7
63.45	1nd	"	"	581.6
62.50	1	"	"	597.7
62.40	1	"	"	598.9
62.00	1	"	"	605.5
61.47	1	"	"	614.3
60.95	1n	"	"	622.8
60.75	1	"	"	626.1
60.4	1n	"	"	632
60.22	1	"	12.0	634.9
59.79	1	"	"	641.8
59.30	1	"	"	650.0
58.88	2n	"	"	657.0
58.4	1n	"	"	665
58.03	1	"	"	671.0
57.72	1	"	"	676.2
57.25	2	"	"	684.0
56.30	1	"	"	700.1
55.77	1	"	"	708.4
55.5	1n	"	"	718
55.1	1n	"	"	719.5
54.46	2	"	"	730.2
53.9	1nd	"	"	739.5

## URANIUM—continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuum
		$\lambda +$	$\frac{1}{\lambda} -$	
2453.52	1	0.72	12.0	40745.8
52.78	1	"	"	758.1
52.21	1	"	"	767.5
51.83	1	"	"	773.9
51.20	1	"	"	784.3
50.90	1	"	"	789.3
50.68	1	"	"	793.0
50.51	1	"	"	795.8
49.92	1	"	"	805.6
49.80	1	"	"	817.6
49.55	1	"	"	811.6
49.21	1	"	"	817.5
48.98	1	"	"	821.1
48.61	1	"	"	827.5
48.37	1	"	"	831.7
47.9	1n	"	"	839.3
47.52	1	"	"	845.8
46.95	1	"	"	855.2
46.60	1nd	"	"	861.2
46.22	1	"	"	867.4
45.78	1nd	"	"	874.7
44.9	1nd	"	"	889.5
44.65	1	"	"	893.7
44.12	2	"	"	902.5
43.60	1	"	12.1	911.3
42.97	2r	"	"	921.6
42.50	1	"	"	929.7
42.0	1b	"	"	938
41.63	1	"	"	944.1
41.40	1	"	"	953.0
40.52	1nd	"	"	962.8
39.6	1b	"	"	978
39.44	1	"	"	980.9
39.14	1	"	"	986.0
38.60	1	"	"	995.1
38.13	1	"	"	41002.9
37.75	1n	"	"	009.4
37.55	1	"	"	012.7
36.70	1	"	"	027.1
36.45	1	"	"	031.2
35.13	1	"	"	053.5
34.84	1	"	"	058.4
34.44	1	"	"	065.1
33.85	2	"	"	075.1
33.37	1	"	"	083.2
32.97	1	"	"	090.0
32.64	1	"	"	095.6
32.41	1	"	"	099.4
31.92	1n	"	"	107.8
31.7	1n	"	"	111
31.35	1	"	"	117.5
30.95	1nd	"	"	124.2
30.23	1	"	"	136.3
29.55	1b	"	"	147.9
29.1	1b	"	"	155



URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2428.53	l	0.72	12.1	41165.1
28.19	l	"	12.2	170.7
27.73	l	"	"	178.6
27.56	l	"	"	181.5
27.20	l	"	"	187.5
26.65	l	"	"	196.9
26.20	l	"	"	204.5
25.46	ln	"	"	217.1
25.1	ln	"	"	223
24.5	ln	"	"	230
24.28	l	"	"	237.2
23.84	l	"	"	244.7
23.35	ln	"	"	253.0
23.15	l	"	"	256.4
22.7	lb	"	"	264
22.0	lb	"	"	276
20.6	lb	0.71	"	300
19.69	l	"	"	315.5
18.90	l	"	"	328.9
18.44	2	"	"	336.8
18.00	l	"	"	344.3
17.73	l	"	"	349.0
16.85	ln	"	"	364.3
16.52	ln	"	"	370.7
14.7	lnd	"	"	401
14.20	ln	"	"	409.4
13.77	l	"	"	416.8
13.05	l	"	"	429.1
12.60	l	"	12.3	437.8
12.38	l	"	"	440.6
11.97	l	"	"	447.6
11.50	l	"	"	455.7
10.35	ln	"	"	475.5
09.67	l	"	"	487.2
09.37	l	"	"	492.3
07.67	l	"	"	521.7
07.15	l	"	"	530.6
06.77	l	"	"	537.2
06.54	l	"	"	541.2
06.3	ln	"	"	545
05.87	ln	"	"	552.7
04.51	l	"	"	576.2
03.50	2n	"	"	593.7
03.00	ln	"	"	602.3
02.58	l	"	"	609.7
02.28	l	"	"	614.8
01.55	ln	"	"	627.1
01.4	ln	"	"	630.1
01.2	ln	"	"	633.5
00.55	l	"	"	644.9
00.42	l	"	"	647.1
00.09	l	"	"	652.8
2399.85	l	"	"	657.0
98.65	ln	"	"	677.9
97.80	l	"	12.4	692.5

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2497.45	2	0.71	12.4	41698.6
97.20	2	"	"	703.0
96.23	1	"	"	719.8
94.14	1	"	"	756.2
93.32	1n	"	"	770.6
92.8	1n	"	"	780
92.4	1n	"	"	787
92.1	1n	"	"	792
91.68	1n	"	"	799.3
91.07	1	"	"	809.9
90.80	1	"	"	814.6
90.48	1	"	"	820.2
90.2	1nb	"	"	825
89.33	1	"	"	840.4
88.51	1	"	"	854.8
87.30	1	"	"	875.9
87.0	1nb	"	"	881
85.65	1	"	"	904.9
85.39	1	"	"	909.5
85.18	1	"	"	913.2
83.45	1nb	"	"	943.6
83.00	1	"	12.5	951.4
80.8	1n	"	"	990
79.85	1	"	"	42006.9
78.67	1	"	"	027.8
78.24	2	"	"	035.4
77.91	2	"	"	041.2
77.58	1	"	"	047.3
77.05	1	"	"	056.5
76.61	1	"	"	064.3
76.24	1	"	"	070.9
75.92	1	"	"	076.5
74.2	1nb	"	"	107
73.00	1	0.70	"	128.2
72.85	1n	"	"	131.1
72.0	1n	"	"	146
71.6	1n	"	"	153
70.96	1	"	"	164.5
70.8	1nb	"	"	167
70.17	1n	"	"	178.6
69.12	1n	"	"	197.3
68.50	1n	"	12.6	208.2
68.2	1nb	"	"	214
67.5	1nb	"	"	226
67.20	1n	"	"	231.4
66.7	1nb	"	"	240
66.05	1n	"	"	251.9
65.7	1nb	"	"	258
65.28	1n	"	"	265.7
64.34	1	"	"	282.5
64.0	1nb	"	"	289
63.50	1	"	"	297.4
62.8	1nb	"	"	310
62.44	1	"	"	316.5
62.1	1nb	"	"	323

## URANIUM —continued.

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2461.53	1	0.70	12.6	41332.9
61.23	1	"	"	338.2
60.85	1n	"	"	344.7
59.5	1nb	"	"	369
58.92	1n	"	"	379.7
58.28	1	"	"	391.2
58.02	1	"	"	395.9
57.67	1	"	"	402.2
56.95	1	"	"	415.1
56.53	1n	"	"	422.7
56.13	1	"	"	430.0
55.70	1	"	"	437.6
55.40	1n	"	"	443.1
55.20	1	"	"	446.7
54.83	1	"	"	453.4
54.3	1nb	"	12.7	463
53.6	1nb	"	"	475.5
52.9	1nb	"	"	488
51.96	2	"	"	505.1
50.2	1nb	"	"	537
49.97	2	"	"	541.0
49.70	2	"	"	545.9
49.00	1n	"	"	558.6
48.35	1n	"	"	570.4
47.6	1nd	"	"	584
47.08	1	"	"	593.4
46.26	2	"	"	608.3
45.50	1n	"	"	622.1
45.08	1n	"	"	629.8
44.65	1	"	"	637.6
44.02	1n	"	"	649.1
42.96	1	"	"	668.3
42.50	1n	"	"	676.7
41.45	2	"	"	695.9
40.99	1	"	12.8	704.1
40.44	1	"	"	714.2
38.98	1n	"	"	722.6
38.57	1	"	"	748.4
38.07	2n (Fe)	"	"	757.5
37.01	2	"	"	777.0
36.50	1n	"	"	786.2
35.88	1n	"	"	797.6
35.20	1	"	"	810.1
34.37	1n	"	"	825.3
33.13	1	"	"	849.2
32.65	1	"	"	857.0
32.23	1	"	"	864.6
31.93	1	"	"	870.1
30.28	1	"	"	900.5
29.50	1	"	"	914.7
29.40	1	"	"	916.8
28.95	1	"	"	925.0
28.58	1	"	"	931.9
28.35	1n	"	"	936.1
27.93	1	"	"	943.8

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda -}$	
2427.45	1	0.70	12.8	42952.8
27.07	1	"	12.9	959.6
26.50	2	"	"	970.0
25.72	1n	0.69	"	984.6
25.51	2	"	"	988.4
24.90	2	"	"	999.7
24.07	1n	"	"	43015.2
23.44	1	"	"	026.7
21.6	1nb	"	"	061
21.1	1nb	"	"	070
20.22	1n	"	"	085.5
18.51	3	"	"	43118.3
18.21	3	"	"	123.8
17.9	1n	"	"	130
17.6	1n	"	"	135
17.2	1nb	"	"	143
15.92	1n	"	"	166.6
15.07	1n	"	"	182.3
14.43	1	"	"	194.3
14.22	1	"	13.0	198.1
13.87	1	"	"	204.6
13.23	1	"	"	216.6
12.60	2	"	"	228.4
11.67	2	"	"	245.8
10.71	2	"	"	263.7
10.43	2	"	"	269.0
09.80	1	"	"	280.8
08.80	1n	"	"	299.5
08.35	1n	"	"	308.0
06.94	2	"	"	334.5
05.68	2	"	"	358.2
04.46	1	"	"	381.1
03.95	1	"	"	390.7
03.70	1n	"	"	395.4
02.75	1	"	"	413.3
01.97	1n	"	"	428.1
01.55	1n	"	"	436.0
01.0	1nb	"	13.1	446
00.80	1n	"	"	450.0
2299.22	1	"	"	479.9
98.41	2	"	"	495.2
97.77	1	"	"	507.4
97.06	1*	"	"	520.8
96.91	2	"	"	523.7
96.29	1	"	"	535.4
95.93	1	"	"	542.2
95.70	1	"	"	546.6
95.40	1	"	"	552.3
94.93	1	"	"	561.2
94.53	1	"	"	568.8
93.65	2	"	"	585.5
91.69	1	"	"	622.8
90.70	1	"	"	641.7
90.60	1	"	"	643.6
89.33	1	"	"	667.8



URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2288.97	1	0.69	13.1	43674.7
88.66	1	"	"	680.5
88.35	1	"	13.2	686.4
87.85	1	"	"	696.0
86.82	1	"	"	715.6
85.76	1n	"	"	735.9
85.23	1n	"	"	746.1
84.90	1	"	"	752.4
83.80	2	"	"	773.5
83.42	1n	"	"	780.8
82.85	2	"	"	791.7
81.9	1n	"	"	810
81.20	1	"	"	823.4
81.03	1	"	"	826.6
80.20	1	"	"	842.6
80.05	1	"	"	845.5
79.15	1	"	"	862.8
78.7	1n	"	"	871.5
78.5	1n	"	"	875
78.0	1n	"	"	885
77.65	1	0.68	"	891.7
77.15	1n	"	"	901.3
76.80	1n	"	"	908.1
76.25	1n	"	"	918.7
76.10	2	"	"	921.6
75.18	1	"	13.3	939.3
74.65	1	"	"	949.5
74.55	1	"	"	951.4
74.15	2	"	"	959.2
73.93	1	"	"	963.4
73.44	2	"	"	972.9
72.73	1	"	"	986.6
72.40	1	"	"	993.0
71.85	1n	"	"	44003.7
70.37	1	"	"	032.4
69.8	lnbr	"	"	043
68.9	lnb	"	"	061
68.55	1n	"	"	067.7
67.3	lnbr	"	"	092
66.02	2n	"	"	116.9
65.50	2n	"	"	127.1
64.4	lnb	"	"	148.5
63.90	1n	"	"	158.3
63.37	1n	"	13.4	168.3
62.80	1n	"	"	179.6
62.45	1n	"	"	186.5
61.5	1n	"	"	205
59.70	1	"	"	240.2
58.00	1n	"	"	273.6
54.60	1n	"	"	340.4
52.8	1n	"	"	376
52.47	1	"	"	382.3
51.18	1	"	"	407.7
49.93	1	"	13.5	432.3
49.35	1n	"	"	443.8

URANIUM—*continued.*

Wave-length Spark Spectrum	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
2248.83	1	0.68	13.5	44454.1
48.06	2	"	"	469.3
47.12	1	"	"	487.9
46.34	1	"	"	503.4
45.00	1n	"	"	529.9
44.40	1n	"	"	541.8
44.17	1n	"	"	546.4
43.65	1n	"	"	556.7
43.45	1n	"	"	560.7
42.73	1n	"	"	575.0
40.18	1	"	"	625.8
39.9	1n	"	"	631
38.02	1	"	13.6	668.8
37.46	2	"	"	679.9
36.57	1	"	"	695.7
35.88	1n	"	"	711.5
34.0	1nb	"	"	749
32.88	1n	"	"	771.6
32.41	1n	"	"	781.0
30.67	1n	"	"	816.0
29.6	1nb	0.67	"	837.5
28.88	1	"	"	852.0
28.39	1n	"	"	861.8
28.23	1n	"	"	865.1
27.95	1n	"	"	870.7
27.18	1n	"	"	886.2
22.35	1	"	13.7	983.7
21.5	1nb	"	"	45001
19.32	1n	"	"	045.1
17.63	1n	"	"	079.5
16.15	1n	"	"	109.6
15.45	1n	"	"	123.9
10.96	1n	"	13.8	215.4
06.05	1n	"	"	316.1
00.80	1	"	13.9	424.1
2194.85	1	"	"	547.3

## RADIUM

Demarçay, C. R. cxxix. 717 (1899).

Runge, 'Astrophys. J.' xii. 1 (1900).

Wave-length		Intensity	Reduction to Vacuum		Oscillation Frequency in Vacuo
Runge	Demarçay		$\lambda +$	$\frac{1}{\lambda} -$	
4826.14	4826.3	10	1.32	5.7	20714.8
4682.346	4683.0	14	1.28	5.9	21351.9
3814.591	3814.7	16	1.06	7.4	26207.7

Demarçay gives also lines at 3649.6, 4340.6, 4364.2, 4436.1, 4458.0, 4533.5, 4600.3\*, 4627.4\*, 4641.9\*, 4692.1\*, 4699.8\*, and 4726.9\*, of which those marked \* appear to be due to Barium.



# APPENDIX M

## EUROPIUM.

Exner and Haschek, 'Sitzber. kaiserl. Akad. Wissensch. Wien,' cxi. 1902.

The spark spectrum contains 1,193 lines, and the arc spectrum 527 lines. Of these the following are extraordinarily strong:—4662.1 (5, 50), 4627.4 (8, 100), 4522.8 (15, 20), 4435.7 (30, 50), 4205.2 (50, 100), 4129.9 (100, 100), 3972.2 (50, 50), 3930.7 (50, 50), 3907.3 (30, 30), 3819.8 (50, 50), 3725.1 (20, 30), 3688.6 (10, 20). The numbers within brackets denote the intensities in the spark- and arc-spectra respectively. None of the other lines have intensities above 5.

## GOLD.

### Ultra-violet Spark Spectrum.

Eder and Valenta, 'Denkschr. kaiserl. Akad. Wissensch. Wien,' lxxviii. 1899.

Exner and Haschek, 'Sitzber. kaiserl. Akad. Wissensch. Wien,' cvii. 1898.

\* Observed in the Arc-spectrum by Kayser and Runge.

† Wave-lengths enclosed within brackets are from Eder and Valenta's previous list of 1896.

Wave-length		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
	4803.4	1b	1.31	5.7	20813
† (4792.79)	* 4792.79	4r	"	"	858.9
( 60.34)	60.37	1n	1.30	5.8	21005.4
—	00.4	1n	1.29	5.9	275
(4683.84)	4683.77	1	1.28	"	344.4
( 07.80)	07.72	3	12.6	6.0	696.7
(4587.91)	4588.0	1b	"	"	789
( 59.05)	59.1	1b	1.25	6.1	960
( 49.64)	49.7	1b	"	"	986
—	4499.1	1n	1.23	"	22221
(4488.43)	* 88.45	4r	"	6.2	273.2
—	75.7	1n	"	"	350
( 37.37)	* 37.50	2r	1.22	"	529.0
—	31.3	1n	"	"	547
( 20.69)	20.80	2r	1.21	6.3	623.2
( 10.55)	10.5	1n	"	"	667
—	00.5	1n	"	"	718.7
(4395.72)	4395.6	1b	"	"	721
( 15.34)	15.37	8r	1.18	6.4	23171.9
—	4278.0	1n	1.17	6.5	369
(4260.01)	60.06	2	"	"	477.3
( 41.95)	* 42.00	2	1.16	6.6	567.1
—	26.89	2ca	"	"	651.4
( 21.87)	22.00	1n	"	"	678.8
(4172.90)	4173.02	2	1.15	6.7	956.7
(4089.95)	4089.9	1b	1.12	6.9	24449
( 84.31)	* 84.30	2	"	"	460.9

\* 4792.79, 4488.46, 37.44, 4241.99, 4084.26.



## GOLD—continued.

Wave-length		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
—	4083.49	2	1.12	6.9	24481.9
—	77.83	1	"	"	521.5
(4076.60)	76.52	1	"	"	523.8
( 65.20)	* 65.25	15	"	"	591.8
—	61.2	1b	"	"	606
—	57.0	1b	"	"	642
( 53.0 )	53.01	7	1.11	"	666.1
( 41.07)	* 41.06	3s	"	7.0	738.9
—	30.1	2b	"	"	801
( 28.66)	28.63	1	"	"	815.3
( 20.86)	20.87	1	"	"	863.0
( 16.27)	16.28	5r	"	"	891.7
( 12.87)	12.8	1n	1.10	"	913
—	12.35	1n	"	"	916.3
—	02.6	1b	"	7.1	999
( 01.60)	01.7	1b	"	"	998
(3986.48)	3986.48	1	"	"	25077.8
( 86.04)	86.1	1n	"	"	075
( 79.72)	79.74	2n	"	"	120.1
( 76.80)	76.77	2n	"	"	138.9
( 59.35)	59.31	2	1.09	"	249.8
( 45.19)	45.2	1n	"	7.2	328
—	33.80	4Ca	1.08	"	425.0
( 33.16)	33.1	1b	"	"	412
( 27.82)	27.84	3	"	"	452.1
( 16.15)	16.2	2b	"	"	516
( 15.03)	14.93	1n	"	"	536.0
( 09.60)	* 09.54	1s	"	"	571.2
(3898.03)	* 3898.1	10r	"	7.3	641
—	90.56	1n	1.07	"	695.9
( 89.58)	89.61	1n	"	"	702.2
—	83.47	1	"	"	742.9
( 80.34)	80.45	2	"	"	762.9
( 77.45)	77.42	2	"	"	783.0
( 74.96)	74.90	3	"	"	799.8
( 65.70)	65.70	1n	"	"	861.2
—	60.8	1n	"	"	894
( 59.53)	59.50	1n	"	"	902.8
( 55.60)	55.52	1n	1.06	"	929.5
( 53.76)	53.72	2n	"	"	941.6
—	49.1	1n	"	"	973
—	47.62	1n	"	"	982.8
( 45.02)	45.02	2n	"	"	26000.4
—	44.42	1n	"	"	004.4
—	42.8	1n	"	"	015
( 37.70)	37.7	1b	"	"	050
—	36.62	1n	"	"	057.3
—	35.40	1n	"	"	065.6
—	32.50	1n	"	"	085.3
( 31.31)	31.27	1n	"	"	093.7
( 29.52)	29.60	1n	"	"	104.8
( 28.56)	28.4	1b	"	"	114
( 25.87)	25.87	3n	"	"	130.5
—	24.5	1n	"	"	140
( 23.20)	23.12	2n	"	"	149.3

\* 4065.22, 41.07, 3909.54, 3898.04.

## GOLD—continued.

Wave-length		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda}$	
(3822.11)	3822.05	3n	1.06	7.3	26156.7
( 20.45)	20.40	1n	"	"	168.0
( 16.50)	16.42	2n	1.05	7.4	195.1
—	10.07	1n	"	"	238.8
—	08.1	1b	"	"	246
( 06.95)	07.1	1b	"	"	253
—	06.5	1b	"	"	263
( 04.22)	04.20	5	"	"	267.0
( 00.75)	00.50	1n	"	"	304.9
(3799.44)	3799.4	1n	"	"	312
—	98.15	1n	"	"	321.2
( 96.15)	96.10	2n	"	"	335.4
—	95.4	1b	"	"	340
—	94.4	1b	"	"	347.2
—	93.0	1n	"	"	357
—	91.93	1	"	"	364.4
—	88.8	1n	"	"	390
( 87.37)	87.4	1n	"	"	396
—	85.4	1n	"	"	410
( 80.13)	80.14	2n	"	"	448.6
—	73.35	2	1.04	"	494.0
( 71.12)	71.1	1n	"	7.5	504
( 70.14)	70.1	1b	"	"	511
( 65.76)	65.73	2	"	"	542.7
( 65.10)	65.0	1n	"	"	553
( 63.10)	63.1	1n	"	"	560
( 59.03)	59.1	1b	"	"	595
( 54.85)	54.8	1b	"	"	625
( 52.90)	52.8	1b	"	"	639
( 46.5 )	46.1	1n	"	"	687
( 32.68)	32.6	1n	1.03	"	783
—	31.8	1n	"	"	789
( 30.92)	31.0	1n	"	"	797
( 18.02)	18.0	1n	"	"	887
—	14.2	1n	"	7.6	916
—	09.8	1n	"	"	948
( 08.30)	08.3	1n	"	"	959
( 06.99)	06.96	3n	"	"	968.7
( 02.49)	02.50	1n	"	"	27001.2
(3698.65)	3698.6	1b	"	"	030
( 95.68)	95.6	1b	1.02	"	052
( 94.14)	94.1	1b	"	"	063
( 90.18)	90.2	1b	"	"	091
( 87.60)	87.6	1b	"	"	110
—	83.00	1n	"	7.7	144.1
( 81.39)	81.60	1n	"	"	154.4
—	80.9	1b	"	"	160
( 77.62)	77.7	1b	"	"	183
( 76.62)	76.6	1b	"	"	191
( 75.11)	75.0	1b	"	"	203
( 72.93)	72.9	1b	"	"	219
( 71.34)	71.3	1b	"	"	231
( 58.05)	58.2	1b	"	"	328
( 57.35)	57.2	1b	1.01	"	335
( 54.56)	54.8	1n	"	"	354

## GOLD—continued.

Wave-length		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
(3654.22)	3654.4	1n	1.01	7.7	27357
( 53.93 )	53.70	2n	"	"	361.8
( 53.66 )					
—	50.95	1	"	"	382.4
( 49.25 )	49.25	2n	"	"	395.2
—	45.1	1b	"	"	426
( 42.66 )	42.6	1b	"	"	445
( 37.57 )	37.6	1b	"	7.8	483
( 35.21 )	35.35	2n	"	"	499.9
—	34.84	2	"	"	503.7
—	34.40	1	"	"	507.1
( 33.40 )	33.40	5s	"	"	514.6
( 32.81 )	32.8	1n	"	"	519
—	31.6	1n	"	"	528
( 31.02 )	31.0	1n	"	"	533
—	23.9	1n	"	"	587
( 23.73 )	23.6	1n	"	"	589
( 22.93 )	22.9	1n	"	"	594
—	20.5	1b	"	"	613
( 14.17 )	14.20	3n <sup>r</sup>	1.00	"	660.8
—	09.74	2	"	"	695.0
( 07.59 )	07.70	2n	"	"	710.7
( 04.94 )	05.0	1n	"	"	731
( 01.17 )	01.22	2n	"	"	760.6
(3598.28)	3598.20	1n	"	"	783.9
( 94.20 )	94.31	1n	"	7.9	813.9
( 91.90 )	92.03	1n	"	"	831.5
—	90.52	1n	"	"	843.2
( 86.66 )	86.84	5n <sup>r</sup>	"	"	871.8
( 55.58 )	55.5	2n	0.99	"	28117.5
( 53.72 )	* 53.70	3n	"	"	131.8
—	51.65	1	"	8.0	147.9
( 49.26 )	49.2	1b	"	"	167
( 48.26 )	48.20	1	"	"	175.3
( 28.25 )	28.1	2n <sup>r</sup>	0.98	"	336
( 23.42 )	23.50	1	"	"	372.9
(3492.99)	3493.02	1n	0.97	8.1	620.4
( 87.34 )	87.33	1n	"	"	667.1
—	87.1	1n	"	"	669
—	81.35	1n	"	"	716.4
( 70.47 )	70.5	1n	"	8.2	806
—	60.8	1n	"	"	887
—	57.05	1n	0.96	"	918.2
( 52.27 )	52.4	1b	"	"	957
—	41.5	1n	"	"	29049
—	21.37	1	"	8.3	219.8
—	04.73	1	0.95	"	362.6
—	04.05	1n	"	"	368.5
(3383.05)	3383.06	2	"	8.4	550.6
—	82.6	1n	"	"	555
( 82.26 )	82.1	1n	"	"	559
( 58.61 )	58.5	1b	0.94	8.5	767
( 55.35 )	55.29	1	"	"	795.2
( 08.36 )	* 08.43	1	0.93	8.6	30217.2
(3230.72)	3280.85	2 Ag	0.92	8.7	471.2

\* 3553.72, 3308.42.

## GOLD—continued.

Wave-length		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
(3273·84)	3274·1	1 Cu	0·92	8·7	30534
( 65·18)	* 65·20	1	"	"	617·3
—	47·65	1	0·91	8·8	782·7
—	42·8	1n	"	"	829
( 30·73)	* 30·76	2n	"	"	943·7
( 28·0 )	28·15	1n	"	"	968·7
( 21·94)	22·0	1b	"	"	31028
( 04·75)	* 04·8	1b	0·90	8·9	194
(3194·90)	*3194·9	1b	"	"	291
( 56·73)	56·78	1	0·89	9·0	668·8
( 22·88)	* 22·97	6	0·88	9·1	32011·7
—	22·63	5s	"	"	015·2
(3033·35)	*3033·3	1b	0·86	9·4	958
( 29·32)	* 29·31	2	"	"	33001·4
( 15·93)	15·97	1	0·85	9·5	147·3
—	2995·09	3	"	9·6	378·4
—	90·42	4s	"	"	430·5
—	82·25	1	0·84	"	522·1
(2954·64)	54·51	3	"	9·7	836·9
( 32·33)	* 32·32	2	0·83	9·8	34092·9
( 18·48)	18·53	1n	"	9·9	254·0
13·63*	13·68	9s	"	"	311·3
07·18	07·19	4s	"	"	387·6
08·07*	08·05	2n	"	"	400·9
2893·51	2893·55	3n	0·82	10·0	549·9
92·05*	92·07	2n	"	"	567·4
85·68	85·72	2	"	"	643·6
83·59*	83·57	3	"	"	669·1
64·63	64·6	1b	0·81	10·1	889
60·80	—	1n	"	"	945·2
57·04	57·00	2n	"	"	991·4
52·65	—	2b	"	"	35045·0
52·30	—	1n	"	"	049·3
47·23	47·20	3n	"	10·2	111·8
38·16	38·13	5s	"	"	224·1
35·55	35·5	2s	"	"	257
33·16	33·17	2s	"	"	286·0
25·56	25·58	6s	"	"	380·9
22·87	22·85	5	0·80	10·3	414·9
20·11	20·11	9n	"	"	449·4
05·44	05·40	2	"	"	635·1
02·35	02·30	10s	"	"	674·5
2795·63	2795·73	2	"	10·4	759·1
80·93	80·96	3s	0·79	"	948·6
—	49·0	1n	"	10·6	36366
48·35*	48·35	5s	"	"	374·9
45·80	—	1s	"	"	408·7
43·27	—	1s	"	"	442·2
32·14	32·10	2s	0·78	"	591·0
21·96	21·94	2s	"	10·7	727·7
—	06·13	1	"	"	942·4
03·44	03·51	2s	"	"	978·7
—	02·54	—	"	10·8	991·4

\* 3265·18, 30·73, 04·81, 3194·82, 22·88, 3033·38, 29·32, 2932·33, 2913·63, 2905·98, 2892·07, 2883·55, 2748·35r.



GOLD—*continued.*

Wave-length		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2701.01*	2701.03	3s	0.78	10.8	37012.2
2699.4	—	1n	"	"	034.5
97.8	—	1s	"	"	056
94.40*	—	2s	"	"	103.2
90.5	—	1n	"	"	157
88.80*	2688.82	4s	0.77	"	180.2
88.26	88.26	3s	"	"	188.0
87.73	87.73	4s	"	"	195.3
86.0	—	1n	"	"	219
82.3	—	1n	"	"	271
76.08*	76.10	12s	"	10.9	357.1
72.3	—	1	"	"	410
70.7	—	1	"	"	432.5
67.09	67.09	2s	"	"	483.1
65.28	65.25	2s	"	"	509.0
—	59.57	1s	"	"	589.2
51.2	—	1s	0.76	11.0	708
45.5	—	2b	"	"	789
41.65	41.56	6s	"	"	845.4
35.4	—	1n	"	"	934
34.4	—	1n	"	"	948
31.7	—	1n	"	11.1	987
27.14	27.09	3s	"	"	38053.8
25.60	25.60	2s	"	"	075.4
24.2	—	2b	"	"	096
22.0	—	2n	"	"	128
17.58	17.48	2s	"	"	193.6
16.69	16.62	3n	"	"	206.1
12.8	—	1n	"	"	262
11.9	—	1n	"	"	275
10.36	10.4	1n	"	"	297
09.61	09.60	2b	0.75	"	309.0
07.4	—	1n	"	11.2	341
05.0	—	1n	"	"	377
2599.5	2599.5	2s	"	"	458
92.18	92.20	2s	"	"	566.1
90.18*	90.18	4s	"	"	596.2
83.5	—	2n	"	11.3	696
80.1	—	1n	"	"	747
79.4	—	1n	"	"	757
77.7	—	1n	"	"	783
75.3	—	1n	"	"	819
71.4	—	2n	"	"	878
65.80	65.80	4s	"	11.4	962.8
62.7	—	2s	0.74	"	39010
61.9	—	1n	"	"	023
58.0	—	2n	"	"	082
52.92	52.9	2s	"	"	159.6
50.28	50.3	2s	"	"	199.8
44.29*	44.3	4s	"	11.5	292.2
38.07	38.09	3n	"	"	388.4
37.0	—	2s	"	"	405
35.92	—	3s	"	"	421.9

\* 2701.03, 2694.40, 2688.86, 2676.05r, 2590.19, 2544.30.

## GOLD—continued.

Wave-length		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2533.70	2533.74	4s	0.74	11.5	39455.9
28.2	28.15	2s	"	11.6	543.0
22.8	—	2n	"	"	627
20.7	—	2s	"	"	660
17.2	—	2n	0.73	"	715
15.15	15.17	2s	"	"	747.1
11.7	—	1n	"	11.7	802
10.59*	10.59	4s	"	"	819.6
06.35	06.38	2s	"	"	886.5
—	06.07	1n	"	"	891.4
03.37	03.33	7s	"	"	934.8
2495.3	—	1s	"	"	40064
92.74	2492.68	2b	"	11.8	105.7
91.58	91.5	1s	"	"	123.4
90.49	90.5	2s	"	"	140.9
88.3	88.98	2s	"	"	165.3
83.4	—	2n	"	"	255
80.35	80.35	3s	"	"	305.1
78.59	78.68	1s	"	"	332.3
77.76	77.80	1s	"	"	346.6
76.2	76.10	3n	"	11.9	374.2
73.84	73.90	1n	"	"	410.0
68.06	68.05	2b	0.72	"	505.9
58.15	58.25	2s	"	12.0	667.3
56.55	—	2b	"	"	695.5
55.34	—	2b	"	"	715.6
52.79	—	2b	"	"	757.9
47.94	48.06	2s Ag	"	"	836.7
46.61	—	1n	"	"	860.9
—	46.20	1n	"	"	867.7
45.6	45.67	3b	"	"	876.6
44.3	—	1b	"	"	900
42.47	42.48	2b	"	12.1	929.9
37.83	37.89	3s Ag	"	"	41007.0
34.5	—	1n	"	"	064
33.67	33.7	2	"	"	078.2
33.3	—	2s	"	"	084
28.06*	28.10	15r	"	12.2	172.3
—	25.05	1n	"	"	224.1
23.8	—	2	"	"	246
19.41	19.4	1n	0.71	"	320.1
19.1	—	1	"	"	327
17.4	—	2	"	"	355
16.68	16.7	2b	"	"	367.9
14.36	—	1n	"	"	406.6
13.27	13.31	3s	"	"	424.7
11.40	11.50	2s	"	12.3	455.7
10.7	—	1s	"	"	470
08.89	—	2n	"	"	500.6
07.42	—	2n	"	"	525.9
05.20	05.24	3s	"	"	563.6
04.97	04.95	2s	"	"	568.6
02.80	02.83	3s	"	"	605.3

\* 2510.56, 2428.06r.

## GOLD—continued.

Wave-length		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2401.63	2401.68	2s	0.71	12.3	41625.2
—	01.3	1n	"	"	632
00.2	—	1 Cu	"	"	651
2399.3	—	1	"	"	666
95.7	—	1	"	12.4	729
93.62	2393.66	2s	"	"	764.6
91.7	—	1n	"	"	799
88.26	88.35	3s	"	"	857.5
87.82*	87.84	4s	"	"	866.5
84.29	—	2s	"	"	928.8
82.50	82.51	3b	"	12.5	960.0
80.5	—	1n	"	"	42095
79.3	—	1s	"	"	017
—	78.0	1n	"	"	040
77.2	77.3	1	"	"	053
76.35	76.31	4s	"	"	069.6
73.20	—	2n	0.70	"	124.7
71.69	71.67	4s	"	"	151.9
69.40	69.46	4n	"	"	174.0
—	68.10	1	"	12.6	215.3
65.01	64.99	6r	"	"	270.9
64.68	64.64	3s	"	"	277.1
59.1	—	1n	"	"	376
57.9	58.02	1n	"	"	395.9
55.53	55.57	2s	"	"	440.3
52.67*	52.81	5s	"	12.7	490.9
51.59	51.61	2s	"	"	511.4
48.2	—	1s	"	"	573
47.10	47.23	2s	"	"	592.0
44.25	—	2s	"	"	644.9
43.6	—	2s	"	"	656
42.81	—	1	"	"	671.1
41.5	—	1	"	"	695
40.27	40.30	7b	"	12.8	716.8
34.20	34.15	2b	"	"	829.3
—	32.00	2n	"	"	868.9
31.45	31.46	2s	"	"	878.8
31.20	—	4s	"	"	883.6
30.7	—	1s	"	"	893
26.7	26.8	1n	"	12.9	964.6
25.77	25.80	2s	0.69	"	983.1
25.34	25.32	2	"	"	991.9
24.7	24.73	1s	"	"	43002.8
22.34	22.39	7s	"	"	046.2
21.4	—	1s	"	"	064
20.35	20.37	2s	"	"	083.7
18.28	18.39	2	"	"	120.5
17.5	17.10	1s Ag	"	"	144.5
15.94	15.96	6s	"	"	165.7
14.73	14.77	6s	"	"	187.9
12.2	12.3	2	"	13.0	234
—	11.06	1	"	"	257.2
09.54	09.50	6s	"	"	286.4
08.2	08.26	1	"	"	309.7
04.89	04.90	9b	"	"	372.8

## GOLD—continued.

Wave-length		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda}$	
2301.1	2301.15	1n	0.69	13.1	43443.4
00.4	—	1s	"	"	458
2298.3	—	1n	"	"	497
96.9	2296.92	2s	"	"	523.5
—	96.62	1	"	"	529.2
95.18	95.20	3s	"	"	556.1
94.08	94.1	2b	"	"	577
91.59	91.60	6b	"	"	624.5
88.70	88.66	2s	"	"	680.6
87.79	87.85	3n	"	13.2	696.0
86.7	86.80	1n	"	"	716.0
83.37 *	83.38	5s	"	"	779.5
82.95	82.94	3n	"	"	890.0
—	80.05	1n Ag	"	"	845.5
79.42	79.40	2n	"	"	858.0
—	78.10	1	"	"	883.0
77.62	77.65	4n	0.68	"	889.7
73.2	73.25	1s	"	13.3	976.6
70.3	70.27	2s	"	"	44034.3
67.03	67.07	2s	"	"	096.5
66.20	66.01	3b	"	"	117.1
65.3	65.10	1n	"	"	134.9
63.75	63.77	3n	"	"	160.8
62.68	62.70	3n	"	13.4	181.6
61.32	61.35	2n	"	"	208.0
60.36	—	2n	"	"	227.3
55.90	55.95	2n	"	"	313.8
55.00	55.1	1n	"	"	331
53.44	53.48	3s	"	"	362.4
—	49.13	1	"	13.5	448.1
48.70	48.77	2n	"	"	455.3
46.76	46.70	3n	"	"	596.2
—	46.50	1	"	"	500.2
—	45.53	1	"	"	519.4
43.6	44.01	1n	"	"	549.6
42.71	42.78	5s	"	"	574.0
—	42.00	—	"	"	589.5
40.36	40.35	3	"	"	622.4
37.56	37.55	2n	"	13.6	678.1
33.75	33.75	2n	"	"	754.2
31.37	31.40	4n	"	"	801.3
29.09	29.07	6n	"	"	848.2
—	24.7	1n	0.67	13.7	936
22.64	22.70	2n	"	"	976.6
20.64	20.62	3s	"	"	45018.8
19.4	19.25	2	"	"	046.6
15.85	15.80	3n	"	"	116.7
13.20	13.25	4s	"	13.8	168.6
10.64	10.73	3s	"	"	220.1
10.30	10.27	1s	"	"	229.5
05.92	05.97	2s	"	"	317.7
01.35	01.42	5s	"	"	45411.3
2193.7	2193.55	1	"	"	574.3
92.7	—	1s	"	"	592.0
90.7	90.57	1s	"	14.0	636.2



## GOLD—continued.

Wave-length		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2188.97	2189.03	4s	0.67	14.0	45668.3
86.9	86.80	2	"	"	714.9
85.7	85.65	2s	"	"	739.0
84.15	84.21	2s	"	"	769.1
72.26	72.28	2s	0.66	14.1	46020.5
67.5	67.40	2s	"	14.2	124.0
—	61.27	1n	"	"	254.9
60.7	60.55	2n	"	"	270.3
59.2	59.13	2n	"	14.3	300.7
57.18	57.21	2n	"	"	341.9
54.4	54.30	2n	"	"	404.5
—	44.27	1	"	14.4	621.5
40.5	40.5	1n	"	"	704
37.95	37.95	2b	"	"	759.4
33.4	33.3	1b	"	14.5	860
—	29.57	1	0.65	"	943.3
29.03	—	1s	"	"	955.2
26.8	26.73	2s	"	14.6	47003.9
25.28	25.32	4s	"	"	037.1
13.7	13.69	1s	"	14.7	295.9
10.74	10.78	6s	"	"	361.1
2098.8	—	1n	"	14.8	631
98.2	2098.18	1s	"	"	645.6
95.0	—	1n	"	14.9	718
85.4	—	1	"	15.0	937
83.1	83.16	1s	"	"	48989.0
82.10	82.16	5s	"	"	012.7
71.7	—	1	0.64	15.1	255
64.0	—	1	"	15.2	434
59.9	—	1	"	"	531
56.6	—	1	"	"	609
55.4	—	1	"	15.3	637
44.65	44.70	5s	"	15.4	891.5
12.10	—	1n	0.63	15.7	49683.6
00.77	00.9	3s	"	15.8	965.0
1988.99	—	1s	"	16.0	50260.8
77.59	1977.6	1	"	16.1	550
72.66	—	1	0.62	"	676.9
55.64	—	1	"	16.3	51117.9
51.59	—	3	"	16.4	223.9
48.48	—	1	"	"	305.7
46.41	—	1	"	"	360.2
44.35	—	1	"	16.5	414.6
35.13	—	1b	"	16.6	659.5
31.74	—	3	"	"	750.2
25.19	—	2	0.61	16.7	926.2
21.38	—	8	"	"	52029.2
19.39	—	6	"	16.8	083.1
18.04	—	1	"	"	119.8
04.41	—	1	"	16.9	492.8
1890.25	—	2	"	17.2	885.9
86.85	—	2	"	"	981.2
79.72	—	1	"	17.3	53182.1
61.68	—	2	0.60	17.5	697.4

## MANGANESE (ARC SPECTRUM).

Hasselberg: 'Kongl. Svenska Vetenskaps-Akadem. Handl.,' Bd. xxx., No. 2. 1897.

\* Coincident with Fraunhofer lines.

† These lines seem not to occur in Exner and Haschek's list of manganese spark lines, Sitzber, 'Kais. Akad. Wissensch. Wien,' civ. (1895), cv. (1896). This list includes 1,550 lines, extending from 4824 to 2112. Within these limits all the lines of the arc spectrum not marked † seem to occur.

Wave-length (Rowland)	Intensity and Character	Previous Observations (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
*5849.33	2		1.59	4.6	17091.4
17.15	2		"	4.7	185.8
*5780.42	3		1.58	"	295.1
* 38.49	4	5737.910 Rowland	1.56	"	421.5
5573.94	5		1.52	4.9	935.7
* 73.27	4		"	"	937.9
56.09	2		"	"	993.4
52.75	2		1.61	"	18004.2
52.24	5	5552.193 "	"	"	005.8
* 38.07	7	{ 38.025 "	"	"	051.9
		{ 37.928 "	"	"	
* 35.77	4		"	"	054.4
* 17.05	7	5517.03 Thalén, { 17.034 "	"	"	120.7
		{ 16.950 "	"	"	
15.06	2		"	"	127.3
* 06.15	5	06.095 "	1.50	5.0	164.5
04.53	3		"	"	166.8
5497.67	2		"	"	184.5
96.23	2		"	"	189.3
81.67	6		"	"	237.6
* 70.86	7	{ 5470.883 "	1.49	"	273.7
		{ 70.802 "	"	"	
* 57.71	4	57.701 "	"	"	317.7
33.67	4n		1.48	"	398.8
* 32.75	5	32.753 "	"	"	401.9
* 20.58	4	5420.50 " { 20.613 "	"	"	443.2
		{ 20.510 "	"	"	
* 13.94	5	13.70 " { 13.889 "	"	"	465.8
* 07.63	7	07.80 " { 07.688 "	"	"	487.4
		{ 07.587 "	"	"	
06.32	2		"	"	495.3
*5399.72	6	00.85 " 5399.675 "	1.47	5.1	514.4
* 94.88	6	5394.75 " { 94.913 "	"	"	531.0
		{ 94.839 "	"	"	
* 88.76	3		"	"	552.0
* 77.83	6	77.85 " 77.800 "	"	"	589.8
77.46	3		"	"	591.0
* 50.08	4	50.059 "	1.46	"	686.2
48.31	2		"	"	712.4
* 44.66	3n	44.646 "	"	"	705.2
* 41.22	9	41.45 " 41.337 "	"	"	717.2
24.53	3		1.45	"	775.9
17.33	2		"	"	801.3
09.16	3n		"	"	830.3
5299.09	2		"	5.2	866.0
98.13	2		"	"	869.4

MANGANESE (ARC SPECTRUM)—*continued*.

Wave-length (Rowland)	Intensity and Character	Previous Observations (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
5261.00	2		1.44	5.2	19002.6
* 55.51	5s	5255.51 Thalén, 5255.492 Rowland	"	"	022.4
* 5197.44	2s	5197.01 " 5197.332 "	1.42	5.3	235.0
* 96.77	5s	96.741 "	"	"	237.4
* 51.14	5s	51.112 "	1.41	"	407.9
* 49.40	3	18.112 "	"	"	414.4
* 18.15	4		1.40	"	532.9
* 5087.02	2		1.39	5.4	652.5
* 74.97	4		"	"	699.1
42.86	2		1.38	"	824.6
30.86	2		"	"	871.9
* 30.02	3		"	"	875.2
22.26	2n		1.37	5.5	905.8
* 10.58	3		"	"	952.2
* 05.10	4s	5005.347 "	"	"	974.1
4985.98	3		1.36	"	20050.7
74.60	3n		"	"	096.6
* 66.02	5s	4966.036 "	"	"	131.3
* 34.25	5s		1.35	5.6	260.9
01.00	2		1.34	"	398.4
4889.12	2		"	"	447.0
* 81.87	2		"	"	478.3
62.28	4		1.33	"	560.9
* 55.01	2		"	5.7	591.6
* 54.76	3		"	"	592.6
* 44.47	4	4844.408 "	"	"	636.4
* 38.40	2		1.32	"	662.3
* 27.10	2		"	"	710.7
* 25.80	2		"	"	716.2
* 23.71	10n r	4823.60 " 23.715 "	"	"	725.2
* 4783.60	10n r	4783.34 " 4783.607 "	1.31	5.8	898.9
* 66.58	7	66.14 " 66.621 "	1.30	"	973.6
* 66.02	7	65.64 " 66.050 "	"	"	976.0
* 62.54	8	62.14 " 62.567 "	"	"	991.4
* 61.68	7	61.34 " 61.718 "	"	"	21995.2
* 54.23	10n r	54.04 " 54.225 "	"	"	028.1
* 39.27	6s	39.14 " 39.291 "	"	"	094.5
* 27.63	7	27.64 " 27.676 "	1.29	"	146.4
* 09.87	7	09.94 " 09.896 "	"	"	226.2
* 01.30	4	01.14 " 01.345 "	"	5.9	262.0
* 4671.86	4s	4671.58 " 4671.858 "	1.28	"	398.8
* 43.01	2		1.27	"	531.8
27.99	2		"	6.0	601.6
* 26.74	4s	26.48 " 26.718 "	"	"	607.5
07.80	3n	07.48 " "	1.26	"	695.9
* 05.55	5n	05.68 " 05.536 "	"	"	706.9
4595.51	3		"	"	754.4
86.30	2		"	"	798.1
48.75	4	4549.05 "	1.25	6.1	978.0
44.61	3		"	"	998.0
* 42.62	4		1.24	"	22007.6
34.72	2		"	"	046.0
30.01	2		"	"	068.9
* 23.58	3	4523.572 "	"	"	100.3
04.03	4	03.95 " 04.042 "	1.23	"	196.2

## MANGANESE (ARC SPECTRUM)—continued.

Wave-length (Rowland)	Intensity and Character	Previous Observations (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuum
			$\lambda +$	$\frac{1}{\lambda} -$	
*4502.38	7	4502.45 Thalén, 4502.388 Rowland	1.23	6.1	22204.4
*4499.06	7	4499.05 " 4499.070 "	"	"	220.8
* 96.82	3	96.05 " 96.676 "	"	6.2	231.7
* 91.86	4	91.85 " 91.823 "	"	"	258.3
* 90.28	7	90.25 " 90.253 "	"	"	264.1
* 79.59	4	79.75 " 79.553 "	"	"	317.3
* 72.92	6	73.15 " 72.967 "	"	"	350.6
* 70.31	6	{ 71.35 " 70.300 "	"	"	363.6
		{ 70.25 " " "	"	"	"
* 64.86	7	65.05 " 64.844 "	1.22	"	390.9
* 62.17	8n	62.25 " 62.165 "	"	"	404.4
* 61.25	7	61.41 " 61.242 "	"	"	409.0
* 60.55	5	60.55 " 60.462 "	"	"	412.6
* 58.43	7	58.45 " 58.409 "	"	"	423.2
* 57.71	6	57.65 " 57.712 "	"	"	426.8
* 57.22	6	57.45 " 57.207 "	"	"	429.1
* 56.05	6	56.15 " 55.980 "	"	"	435.2
* 55.50	6	55.55 " 55.485 "	"	"	438.0
* 55.19	6	55.25 " 55.193 "	"	"	440.0
* 53.16	6	53.25 " 53.171 "	"	"	450.3
52.73†	3	" " " "	"	"	452.4
* 51.75	7	51.95 " 51.752 "	"	"	456.9
* 47.32	3	47.45 " 47.302 "	"	"	479.2
* 36.52	6	36.45 " 36.516 "	"	"	534.0
36.24	3	" " " "	"	"	535.4
* 19.96	4s	20.05 " 19.944 "	1.21	6.3	618.3
* 15.06	6	15.05 " 15.047 "	"	"	638.6
* 12.06	4	12.15 " 12.043 "	"	"	658.8
* 08.28	3	08.35 " " "	"	"	678.3
4389.95	3	" 4389.930 "	1.20	"	773.0
88.27	?	88.260 "	"	"	781.7
82.80	3n	4383.10 " 82.847 "	"	"	810.2
81.87	4	82.30 " 82.045 "	"	"	815.0
* 75.10	4	75.30 " 75.103 "	"	"	850.3
37.57	2	" 37.569 "	1.19	6.4	23048.0
26.35	—	26.10 " " "	"	"	107.8
23.59	—	" " " "	"	"	122.5
21.36	—	23.50 " " "	"	"	134.5
* 12.70	5	21.40 " 12.723 "	1.18	"	180.9
05.84	2	" " " "	"	6.5	217.8
00.35	3	00.23 " 00.376 "	"	"	247.4
4290.29	2	" " " "	"	"	301.9
* 84.22	5	4284.53 " 4284.223 "	"	"	335.0
* 81.27	6	81.33 " 81.257 "	"	"	351.0
78.85	3	" " " "	1.17	"	364.2
* 66.08	6	66.33 " 66.081 "	"	"	434.2
* 61.45	3	61.63 " 61.496 "	"	"	459.7
* 58.48†	2	" " " "	"	"	476.0
* 57.80	6	58.03 " 57.815 "	"	"	479.8
* 39.88	6	40.03 " 39.890 "	1.16	6.6	579.0
* 35.45†	6	35.43 " 35.450 "	"	"	603.6
* 35.28	6	" 35.298 "	"	"	604.6
30.47†	2	" " " "	"	"	631.4
30.31	2	" " " "	"	"	632.3
* 20.79	5	21.13 " 20.738 "	"	"	685.6



MANGANESE (ARC SPECTRUM)—*continued*.

Wave-length (Rowland)	Intensity and Character	Previous Observations (Rowland)		Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
*4212.64†	2			1.16	6.6	23731.5
* 11.90	4	4211.899	Rowland	"	"	735.6
* 01.88	4	4202.23	Thalén, 01.869	1.15	"	792.3
*4190.15	4	4190.147	"	"	6.7	858.8
* 76.73	5	76.739	"	"	"	935.5
* 57.21	3	57.167	"	1.14	"	24048.5
55.68†	3			"	"	056.7
* 51.16	3			"	"	082.9
* 48.94	5	48.948	"	"	6.8	095.7
* 47.65	4	47.645	"	"	"	103.2
* 41.18	5	41.208	"	"	"	140.9
* 40.85	2			"	"	145.7
* 37.40†	4	37.428	"	"	"	163.0
* 35.13	5	4135.26	" 35.191	"	"	175.2
34.77	4			"	"	178.3
32.45	2			"	"	188.7
31.60†	2			"	"	201.9
* 31.26	5	31.271	"	"	"	203.9
* 23.68	3	23.664	"	1.13	"	243.4
* 23.41	3			"	"	245.0
22.92	3			"	"	247.8
14.53	4	14.461	"	"	"	297.3
* 14.02	3s			"	"	300.3
* 13.39	4	13.381	"	"	"	304.0
* 10.98	6	11.021	"	"	"	318.3
* 08.01	3			"	"	335.9
* 05.51	5	05.514	"	"	"	350.7
* 03.62	3			"	"	361.9
* 03.07	4	03.097	"	"	"	365.2
4099.57	2			"	6.9	386.0
* 96.81†	3			"	"	402.2
* 95.42	4	4095.423	"	"	"	407.2
95.17	2			"	"	412.0
90.73	2			1.12	"	438.6
90.10	4	90.113	"	"	"	442.3
* 83.75	9	4083.83	" 83.783	"	"	480.4
* 83.09	9	83.13	" 83.095	"	"	484.4
* 79.56†	9	79.43	" 79.570	"	"	505.5
* 79.35	9		79.393	"	"	506.5
* 75.39	3		70.431	"	"	530.6
* 70.41	6		68.137	"	"	560.6
* 68.13	4s also Fe			"	"	574.4
66.38	3		65.239	"	"	585.0
* 65.22	4			"	"	593.3
* 63.38	7 also Fe	63.63	" 63.573	"	"	603.2
* 61.88	6		61.881	"	"	612.2
* 59.53	6		59.535	"	"	626.5
* 59.08	7		59.081	"	"	629.2
* 58.10	5		58.115	"	"	635.2
* 55.68	9	56.43	" 4055.701	"	"	649.9
55.35†	4		55.365	"	"	651.9
* 52.62	4		52.603	1.11	"	668.5
* 51.90	4			"	7.0	672.8
* 49.16†	4			"	"	689.5
* 48.88	8	48.83	" 4048.910	"	"	691.2

MANGANESE (ARC SPECTRUM)—*continued.*

Wave-length (Rowland)	Intensity and Character	Previous Observations (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuum
			$\lambda +$	$\frac{1}{\lambda} -$	
*4045.26	6	4045.266 Rowland	1.11	7.0	24713.3
* 41.49	10n also Fe	4041.23 Thalén, 41.525	"	"	736.3
38.89†	4	38.771	"	"	752.3
* 35.88	6	4035.883	"	"	770.7
* 34.60	20n r	34.63 " 34.644	"	"	778.6
* 33.18	20n r	33.53 " 33.230	"	"	787.3
* 30.87	20n r	30.13 " 30.919†	"	"	801.5
* 26.57	6	26.583	"	"	828.0
* 20.18	3	20.226	"	"	867.5
* 18.25	7	18.25 †	"	"	879.4
12.09	2		1.10	"	917.6
11.69	3	11.693	"	"	920.1
08.19	3	08.215	"	"	941.9
03.42	2		"	7.1	971.5
02.31†	2	02.308	"	"	978.5
02.05	2	02.086	"	"	980.1
3997.34	2	3997.365	"	"	25009.5
92.65	3	3992.5 Lockyer	"	"	038.9
* 90.10	2	90.0 " 90.129	"	"	054.9
87.61	2	87.625	"	"	070.6
* 87.23	4	3987.244	"	"	073.0
* 86.94	4	86.979	"	"	074.8
* 85.36	4	85.463	"	"	084.7
84.31	2	3984.294	"	"	091.3
83.07†	2	83.053	"	"	099.2
* 82.72	4	82.630	"	"	101.4
82.31	2		"	"	103.0
77.24	3	77.2 " 77.223	"	"	136.1
* 76.03	3	75.6 " 75.985	"	"	143.5
53.00	4	52.7 " 53.043	1.09	7.2	290.0
43.01	3n	43.0 " 42.984	"	"	354.1
36.91	2	36.912	"	"	393.4
29.82	2	29.6 " 29.864	1.08	"	439.3
29.41	—		"	"	441.9
* 29.30†	3	29.363	"	"	442.6
* 26.61	5	26.5 " 26.597	"	"	459.1
* 24.24	4	24.2 " 24.206	"	"	480.4
* 23.45	3	23.5 " 23.375	"	"	480.6
* 22.82†	5n	22.8 " 22.815	"	"	484.7
* 22.20	2	22.223	"	"	488.7
* 21.85†	4n	21.8 " 21.855	"	"	491.0
* 18.43	4	18.3 " 18.396	"	"	513.2
16.75	2	16.661	"	"	524.2
11.57	3	11.5 " 11.554	"	"	558.0
11.27	3n	11.2 "	"	"	559.9
08.34	2s		"	7.3	579.0
05.12	2		"	"	600.1
04.47	2		"	"	604.9
03.68	2		"	"	616.1
3899.81†	4s	3899.701	"	"	635.0
99.46	3s	99.530	"	"	637.2
* 98.50	4	98.531	"	"	643.5

† double { 4080.497      † { 4018.269  
              30.878                      18.234

MANGANESE (ARC SPECTRUM)—*continued*.

Wave-length (Rowland)	Intensity and Character	Previous Observations (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3897.47	2		1.08	7.3	25650.4
96.48	3s	3896.385 Rowland	1.07	"	656.9
* 94.85	3s	94.850 "	"	"	667.6
* 92.72	2	92.698 "	"	"	681.7
* 91.92	3		"	"	687.0
89.62	2	89.498 "	"	"	699.9
* 86.42	5s also Fe		"	"	727.3
79.32	2		"	"	770.4
72.26	2		"	"	817.4
65.83	2		"	"	860.4
* 61.88†	3		"	"	886.8
56.68	4		"	"	921.7
* 53.60	3		1.06	"	942.5
* 44.10	7	44.135 "	"	"	26006.6
* 41.17	8 also Fe	41.195 "	"	"	026.4
* 39.92	7	39.922 "	"	"	034.9
37.68	3		"	"	050.1
* 34.48	9	34.506 "	"	"	071.8
* 33.96	7	34.006 "	"	"	075.4
30.12†	2		"	"	101.5
* 29.81	5		"	"	103.6
* 24.01	7	24.028 "	"	"	143.3
* 23.64	8	23.653 "	"	"	145.8
* 16.87	5	16.887 "	1.05	7.4	192.1
10.85	4		"	"	233.5
09.70	6	09.732†	"	"	239.5
* 06.84	9 also Fe	06.865 "	"	"	261.1
02.04	4	02.051 "	"	"	294.3
* 00.68	4	00.683 "	"	"	303.7
* 3799.38	4	3799.386 "	"	"	312.7
* 90.36	6	90.362 "	"	"	375.3
* 85.57	3		"	"	408.7
* 76.70	3s	76.698 "	1.04	"	470.7
* 74.81	2		"	"	484.0
* 74.02	2		"	"	489.5
71.62	2		"	7.5	506.3
68.33	2		"	"	529.4
* 67.84	4	67.787 "	"	"	532.9
63.51	4		"	"	563.4
* 56.80	3	56.705 "	"	"	610.9

† Double { 3809.834 Rowland's Table of Solar Spectrum Wave-lengths gives  
09.633.

the following lines (not mentioned in the above list) as due to Manganese:  
5457.640, 12.997, 5321.976, 4884.242, 4233.328, 4171.854, 4092.547, 83.376, 45.371,  
33.814, 33.732, 31.942, 07.185, 3954.680, 52.103, 37.972, 3895.583, 88.971, 40.340,  
3696.800, 95.658, 91.452, 84.680, 58.689, 58.044, 17.575, 15.531, 3590.109, 11.763,  
3488.437, 87.095, 74.287, 74.197, 60.174, 55.204, 55.121, 51.609, 42.118, 20.940,  
3386.085, 82.825, 82.129, 79.005, 70.770, 69.352, 68.319, 55.661, 45.495, 43.804, 30.802,  
20.783, 17.393, 16.698, 16.561, 14.995, 14.574, 14.334, 13.562, 13.301, 12.063, 08.888,  
07.114, 05.001, 03.398, 3299.652, 98.361, 97.014, 95.951, 80.900, 78.687, 73.175, 70.473,  
68.847, 64.833, 60.386, 58.542, 56.264, 55.617, 54.180, 53.090, 51.273, 48.637, 43.883,  
40.726, 40.522, 36.905, 30.843, 28.219, 26.143, 24.882, 17.040, 13.004, 3178.620, 67.289,  
61.146, 48.283, 42.846, 40.430, 3079.724, 73.232, 70.372, 66.101, 62.222, 54.429, 48.999,  
47.156, 45.695, 44.671, 40.712, 22.861, 2801.183, 2798.369, 94.911, 2593.810, 76.195.



MANGANESE (ARC SPECTRUM)—*continued*.

Wave-length (Rowland)	Intensity and Character	Previous Observations (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3750.92	4	3750.916 Rowland	1.04	7.5	26652.6
49.54	3		"	"	662.4
46.78	4	46.717 "	"	"	682.1
* 37.03	3	37.059 "	1.03	"	751.7
32.05	5	32.072 "	"	"	787.4
* 29.05	4	29.004 "	"	"	809.0
27.21†	2	27.061 "	"	7.6	822.1
* 19.04	5	19.070 "	"	"	881.1
* 06.16	5	06.175 "	"	"	974.5
* 01.85	3s	01.866 "	"	"	27005.9
* 00.47	2		"	"	016.0
*3696.69	5	3696.707 "	1.02	"	044.6
94.28	3n		"	"	061.3
* 93.81	5	93.804 "	"	"	064.7
* 92.98	3	92.954 "	"	"	070.8
* 85.69†	2	85.665 "	"	"	124.4
85.04	2		"	"	129.1
* 82.24	4	82.161 "	"	7.7	149.7
80.32	2		"	"	163.8
* 77.12	4		"	"	187.5
* 70.67	3	70.678 "	"	"	235.3
* 70.00	2	69.976 "	"	"	240.3
* 69.54	2		"	"	243.7
* 60.52	4	60.549 "	"	"	310.8
* 41.60	2	41.597 "	1.01	7.8	452.6
35.89	2		"	"	495.8
* 29.87	4	29.877 "	"	"	541.4
* 23.92	5	23.925 "	"	"	586.6
* 19.42	6	19.412 "	"	"	620.9
* 10.44	6	10.435 "	1.00	"	689.6
* 08.62	6	08.630 "	"	"	703.6
* 07.66	6	07.672 "	"	"	711.0
01.96	2		"	"	754.9
01.45	2		"	"	758.8
*3595.25	5	3595.256 "	"	"	806.7
* 86.65	6	86.684 "	"	"	873.3
* 77.99	7	78.014 "	0.99	7.9	940.7
* 70.18	5n	70.183 "	"	"	28001.9
* 69.91	5n	69.958 "	"	"	004.0
* 69.66	8n	69.649 "	"	"	006.0
* 48.35†	5n	48.332 "	"	"	174.1
* 48.17	5n	48.175 "	"	8.0	175.5
* 47.94	5n	47.941 "	"	"	177.4
* 32.27	5n	32.262 "	0.98	"	302.4
* 32.14	5n	32.143 "	"	"	303.4
* 31.97	5n	31.982 "	"	"	304.8
*3497.67	3	97.668 "	0.97	8.1	582.3
* 96.96	3	96.952 "	"	"	588.2
* 95.99	4	95.974 "	"	"	596.1
* 88.80	4	88.817 "	"	"	655.0
* 83.01	4	83.047 "	"	"	702.7
* 60.47	5	60.460 "	"	8.2	889.6



## SILICON (SPARK SPECTRUM).

Eder and Valenta, 'Sitzber. kais. Akad. Wissensch. Wien,' cvii. (2), 1898.

Exner and Haschek, *ibid.*, cviii. (2), 1899.

Lockyer, 'Proc. Royal Soc.,' lxxv. p. 449. 1900.

† Observed also by Count de Gramont, who gives also lines at 6969·7, 6342·2, 5978·9, 5960·3, 5948·0?, 5060·0, 5045·5.

\* Observed also by Rowland, whose values are 4103·101, 3905·666, 2987·766, 2881·695, 2631·392, 2528·599, 2524·206, 2519·297, 2516·210, 2514·417, 2506·994, 2443·460, 2438·864, 2435·247, 2216·760, 2211·759, 2210·939, 2208·060. Rowland gives also lines at 5948·761, 5771·360, 5708·620, 5645·835, and 2218·146.

‡ 3807 Lunt, 'Astroph. J.' xi. p. 269 (1900).

Eder and Valenta		Exner and Haschek		Lockyer	Reduction to Vacuum		Oscillation Frequency
Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	$\lambda +$	$\frac{1}{\lambda}$	
—	—	4764·20	1	—	1·31	5·8	20984·0
—	—	†4574·9	1n	4575·3	1·25	6·0	21852
—	—	† 67·95	1n	68·0	"	"	885·4
—	—	† 52·75	3n	52·8	"	6·1	957·5
†4131·0	4b	—	—	4131·4	1·13	6·8	24200
† 28·2	4b	4128·1	5b	28·3	"	"	217
—	—	—	—	16·4	"	"	292
—	—	* 03·2	1n	—	"	"	364
—	—	4096·8	1b	—	"	6·9	402
—	—	—	—	4089·1?	1·12	"	447?
—	—	30·1	2b	—	1·11	7·0	743
—	—	21·0	1b	—	"	"	862
3905·80	3b	*3905·71	5r	—	1·08	7·3	25594·5
—	—	3883·46	1	—	1·07	"	739·7
—	—	71·60	1 (CN)	—	"	"	819·4
3862·75	3b	62·80	4n	3862·7	"	7·5	880·7
56·20	3b	56·19	5n	56·1	1·06	"	924·7
54·00	1b	54·02	1n	—	"	"	939·5
—	—	53·62	1n	—	"	"	942·1
34·4	1	—	—	—	"	"	26072
26·7	1	—	—	—	"	"	125
—	—	†06·90	3n	—	1·05	7·4	260·6
3795·9	2	3796·50	2n	—	"	"	332·6
91·1	1	91·8	1b	—	"	"	366
—	—	91·0	1n	—	"	"	371
3191·1	1	—	—	—	0·90	8·9	31328
—	—	3093·6	1b	—	0·87	9·2	32315·8
3086·8	1	86·6	1b	—	"	"	389
2987·77	4	*2987·77	1	—	0·84	9·6	33450·8
2881·70	10	*2881·73	15	—	0·82	10·0	34688·4
2689·8	1	—	—	—	0·77	10·8	37181
77·4	1	—	—	—	"	10·9	338
59·0	1	—	—	—	"	"	597
31·39	8	*2631·38	3	—	0·76	11·0	983·6
2568·8	2	2568·8	1n	—	0·75	11·3	38917
41·89	8	41·90	2	—	0·74	11·5	39330
34·7	1	—	—	—	"	"	440·9
33·2	4	32·45	1	—	"	"	452·6
28·60	8	* 28·60	8	—	"	11·6	530
24·21	8	* 24·21	6	—	"	"	593·6
19·30	8	* 19·30	5	—	"	"	666
16·21	10	* 16·26	10	—	0·73	"	719·4
14·42	7	* 14·41	5	—	"	"	750·8

SILICON (SPARK SPECTRUM)—*continued*.

Eder and Valenta		Exner and Haschek		Lockyer	Reduction to Vacuum		Oscillation Frequency
Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	$\lambda +$	$\frac{1}{\lambda} -$	
2506.99	8	*2507.01	6	—	0.73	11.7	39861.0
2479.8	1	2478.68	1 (CN)	—	"	11.8	40317.6
52.22	3	52.23	1n	—	"	12.0	752.9
46.0	3	45.63	1	—	0.72	"	871.7
—	—	* 43.91	1n	—	"	"	904.7
43.46	2	* 43.47	1n	—	"	"	905.4
38.86	2	* 38.87	1n	—	"	12.1	988.5
35.25	8	35.22	3	—	"	"	41040.1
2356.9	1	—	—	—	0.70	12.6	42416
03.3	1	—	—	—	0.69	13.0	43403
—	—	2296.96	1 (C)	—	"	"	522.1
2219.5	1	—	—	—	0.67	13.7	45041
18.15	1	—	—	—	"	"	053.4
16.76	4	* 16.75	1n	—	"	"	092.8
11.8	3	* 11.87	1n	—	"	13.8	194.4
10.9	3	* 10.97	1	—	"	"	217.3
08.1	3	* 08.1	1	—	"	"	274
2122.8	2	—	—	—	0.65	14.6	47092
1929.0	1	—	—	—	0.62	16.6	51823

## ARGON (VACUUM TUBE).

The red end of the red spectrum of Argon.

Runge, 'Astroph. J.,' ix. p. 281. 1899.

Runge and Paschen, 'Astroph. J.,' viii. 99. 1898.

\* These lines belong also to the 'blue spectrum.'

Wave-length (Runge)	Intensity	Previous Measurements			Reduction to Vacuum		Oscillation Frequency
		Runge and Paschen	Kayser	Crookes	$\lambda +$	$\frac{1}{\lambda} -$	
8014.73	1	—	—	—	2.17	3.4	12473.6
06.00	1	—	—	—	2.16	"	487.2
7948.32	1	7952	—	—	2.15	"	577.9
7724.15	2	7725	7723.4	—	2.09	3.5	942.9
7635.19	3	7636.2	7635.6	7646	2.07	"	13093.7
7514.77	3*	7515.4	7515.1	—	2.04	3.6	303.5
04.04	7	04.5	03.4	7506	2.03	"	322.6
7435.77	1	—	—	—	2.01	"	444.9
7384.18	5*	7384.22	7383.9	7377	2.00	3.7	538.8
72.28	1	—	—	—	—	—	560.6
53.42	1	—	—	—	1.99	—	597.3
16.15	1	—	—	—	1.98	—	664.7
11.80	1	—	—	—	—	—	672.8
7273.13	5*	7273.04	7271.6	7263	1.97	—	745.5
07.20	1	—	—	—	1.95	—	871.3

Nasini, Anderlini, and Salvadori [*Accad. Lincei Atti*, viii. 269 (1899)] give infra red lines at 7980, 8030, 8140, 8320, 8450, and 8575.

ARGON (VACUUM-TUBE)—*continued*.

† These lines belong only to the 'blue spectrum.'

Wave-length	Intensity and Character	Previous Measurements		Reduction to Vacuum		Oscillation Frequency
		Kayser	Crookes	$\lambda +$	$\frac{1}{\lambda}$	
7147.30	1	7146.8	—	1.94	3.8	13987.5
7068.83	1	—	—	1.92	"	14142.8
67.54	5*	7066.6	7056.4	"	"	155.4
30.54	2*	29.2	—	1.91	"	219.9
6965.81	6*	6964.8	6965.6	1.89	3.9	351.9
37.99	2*	37.8	—	1.88	"	409.5
6888.83	1	—	—	1.87	"	512.3
80.26	1	—	—	"	"	30.4
71.56	4*	6870.6	—	1.86	"	48.8
27.85	< 1	—	—	"	4.0	641.9
6766.97	1	—	—	1.83	"	773.7
56.58	1	—	—	"	"	96.4
53.15	5*	6752.7	6754	"	"	803.9
19.33	2	—	—	1.82	"	78.4
6699.06	3	—	—	"	"	923.5
84.95	< 1†	6684.2	—	"	"	55.0
82.7	2	—	—	1.81	"	60
79.01	< 1	—	—	"	"	68.3
77.61	6*	76.5	6664	"	"	71.4
64.27	3	—	—	"	4.1	15001.3
60.92	3	—	—	"	"	08.8
44.3	3†	44.2	—	1.80	"	46
40.5	1†	—	—	"	"	55
38.7	2†	38.6	—	"	"	59
32.07	1	—	—	"	"	74.1
15.2	< 1†	—	—	"	"	113
05.05	4	—	—	1.79	"	35.9
6538.43	3*	—	—	1.78	"	290.1
13.87	1	—	—	1.77	"	347.8
6494.10	2	—	—	1.76	4.2	94.4
83.6	3†	6482.8	—	"	"	419
81.17	2	—	—	"	"	25.1
66.65	3	—	—	"	"	59.8
31.77	3	—	—	1.75	"	543.6
16.54	8*	15.2	6407	1.74	"	80.5
02.21	1	—	—	"	"	615.4
6384.89	5*	6384.5	6377	"	"	57.8
69.74	4	68.0	—	"	"	95.0
65.02	3	—	—	1.73	"	706.7
34.24	< 1	—	—	1.72	4.3	82.9
09.36	1	—	—	"	"	845.2
07.91	5	07.8	—	"	"	48.8
6299.01	< 1	—	—	1.71	"	71.2
97.15	5	6296.8	6302	"	"	75.9
78.80	2	—	—	"	"	922.3
66.70	1	—	—	1.70	"	53.1
59.58	< 1	—	—	"	"	71.2
48.65	4	—	—	"	"	99.2
43.45	3†	43.7	—	"	"	16012.5
40.5	< 1†	—	—	"	"	20
38.58	< 1	—	—	"	"	25.0



ARGON (VACUUM-TUBE)—*continued*.

Wave-length	Intensity and Character	Previous Measurement		Reduction to Vacuum		Oscillation Frequency
		Kayser	Crookes	$\lambda +$	$\frac{1}{\lambda} -$	
6235.99	1	43.7	—	1.70	4.3	16031.6
30.96	2	—	—	1.69	—	40.6
24.85	1	—	—	—	—	60.3
—	—	17.5	—	—	4.4	79.2
16.14	6	—	—	—	—	82.7
—	—	15.6†	—	—	—	84.2
12.73	6	12.5	6210	—	—	91.6
6199.44	<1	—	—	—	—	126.1
97.30	<1	—	—	—	—	31.7
94.25	<1	—	—	—	—	39.6
89.5	<1†	—	—	1.68	—	52
86.52	<1	—	—	—	—	59.8
83.12	<1	—	—	—	—	68.7
79.50	2	—	—	—	—	78.1
73.32	6*	6172.9	6173	—	—	94.3
72.7	5†	72.3	—	—	—	96
70.39	5	70.3	—	—	—	202.0
65.30	3	—	—	—	—	15.4
61.68	2	—	—	—	—	24.9
59.60	1	—	—	—	—	30.4
55.46	5	55.2	—	1.67	—	41.3
45.64	6	45.6	6143	—	—	67.3
43.16	1	—	—	—	—	73.9
39.1	1†	40.9	—	—	—	85
35.63	1	—	—	—	—	93.8
34.12	<1	—	—	—	—	97.9
29.02	3	—	—	—	—	311.4
27.57	4	—	—	—	—	15.3
25.96	1	—	—	—	—	19.6
23.8	<1†	—	—	—	—	25
21.93	2	—	—	—	—	30.3
19.74	3	—	—	—	—	36.2
15.05	2†	14.1	—	1.66	—	48.7
13.55	3	—	—	—	—	52.7
05.87	6	06.1	—	—	—	73.3
04.71	3	—	—	—	—	76.4
01.33	3	—	—	—	—	85.5
6099.03	6	6098.8	6099	—	—	91.6
96.09	1	—	—	—	—	99.6
93.44	1	—	—	—	—	406.7
90.97	4	—	—	—	—	13.3
85.90	1	—	—	—	4.5	26.9
81.50	2	—	—	—	—	38.8
75.20	<1	—	—	1.65	—	55.9
67.48	<1	—	—	—	—	77.8
64.93	3	—	—	—	—	83.7
59.62	7	59.5	6056	—	—	98.2
52.96	6	52.7	—	—	—	516.3
43.48	8	43.0	6045	—	—	42.2
40.46	<1	—	—	1.64	—	50.5
35.49	<1	—	—	—	—	64.2
32.39	9	31.5	6038	—	—	72.7

|| 6043.68, 6032.69, Eder and Valenta.



ARGON (VACUUM-TUBE)—*continued.*

Wave-length	Intensity and Character	Previous Measurement		Reduction to Vacuum		Oscillation Frequency
		Kayser	Crookes	$\lambda +$	$\frac{1}{\lambda} -$	
6025.40	4	6025.8	—	1.64	4.5	16591.9
17.66	1	—	—	"	"	613.3
15.40	<1	—	—	"	"	19.5
13.94	4	13.6	—	"	"	23.5
11.59	1	—	—	"	"	30.0
05.95	3	—	—	"	"	45.7
5999.29	4	5999.5	—	1.63	"	64.2
94.99	2	—	—	"	"	76.1
87.61	5	87.5	—	"	"	91.7
82.22	2	—	—	"	"	716.7
71.91	4	—	—	"	"	40.6
68.58	3	—	—	"	"	49.9
64.70	3	—	—	1.62	"	60.8
60.78	<1	—	—	"	4.6	71.8
49.47	3	—	—	"	"	803.7
42.92	5	43.5	—	"	"	22.1
41.08	3	—	—	"	"	27.3
29.06	6	28.5	5926	1.61	"	61.5
27.34	3	—	—	"	"	66.4
30.33	<1	—	—	"	"	86.3
20.04	<1	—	—	"	"	87.1
16.84	3	—	—	"	"	96.3
12.31	7	12.22	5909	"	"	909.3
04.09	<1	—	—	"	"	32.8
00.70	<1	—	—	"	"	42.5
5897.75	<1	—	—	"	"	51.0
88.79	6	5888.93	5887	1.60	"	76.8
82.88	4	82.78	—	"	"	93.9
80.41	<1	—	—	"	"	17001.0
70.52	1	—	—	"	"	29.7
64.29	<1	—	—	"	"	47.8
60.54	4	60.61	5858	"	"	58.7

|| 5928.61, 5912.48, 5889.02, 5883.03, 5860.69, Eder and Valenta.

## VANADIUM.

Hasselberg : 'Kongl. Svenska Vetenskaps-Akadem. Handl.,' Bd. xxxii., No. 2. 1899.  
 Rowland and Harrison : 'Astrophys. Jour.' April 1898.  
 Exner and Haschek : 'Sitzber. kais. Akad. Wissensch. Wien,' Bd. cvii. (2). 1898.  
 Lockyer and Baxandall : 'Proc. Roy. Soc.,' vol. lxxviii. p. 189. 1901.

† Coincident with Fraunhofer lines.

Arc Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison		$\lambda +$	$\frac{1}{\lambda} -$	
5850.60	—	2	1.59	4.6	17087.7
46.56	—	4n	"	"	099.5
39.34	—	2	"	4.7	120.5
30.97	—	4n	"	"	145.1

VANADIUM—*continued.*

Arc Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison		$\lambda +$	$\frac{1}{\lambda} -$	
5817.80	—	3	1.59	4.7	17183.9
17.33	—	3	"	"	185.3
07.40	—	4	1.58	"	214.7
00.17	—	3	"	"	236.2
5788.85	—	3	"	"	269.9
86.42	5786.413	4	"	"	277.2
84.64	84.646	4	"	"	282.5
83.76	83.764	2	"	"	285.1
83.14	—	2	"	"	286.9
82.85	82.848	2	"	"	287.8
76.95	76.930	4n	1.57	"	305.5
72.66	72.657	4s	"	"	318.3
61.70	61.674	3	"	"	351.3
52.99	52.985	3	"	"	377.6
50.90	—	3	"	"	383.9
49.13	—	4s	"	"	389.2
47.98	—	2s	"	"	392.7
43.67	43.675	5	"	"	405.8
37.28	37.310	6	1.56	"	425.1
34.26	34.254	4	"	"	434.3
33.63	—	2	"	"	435.3
33.34	33.336	3	"	"	437.1
31.48	—	7	"	"	442.8
27.90	27.900	5	"	"	453.7
27.25	27.289†	8	"	"	455.6
25.90	25.881	4s	"	"	459.8
16.49	16.461	3	"	4.8	488.5
09.25	09.198	3	"	"	510.7
07.26	07.236†	7	"	"	516.8
03.83	03.825†	7	1.55	"	527.3
5698.74	5698.765	8	"	"	542.9
88.02	87.998	2	"	"	576.0
83.47	83.451	3	"	"	590.1
71.10	71.091	7	"	"	628.5
68.61	68.608	5	"	"	636.2
57.67	57.689	5	"	"	670.3
57.11	57.119	2	1.54	"	672.1
46.36	46.352	5	"	"	705.7
35.76	35.742	3	"	"	739.1
—	34.145	2	"	"	744.1
32.73	32.702	2	"	"	748.6
27.86	27.886†	7	1.53	"	763.9
26.27	26.267	5	"	"	769.0
25.16	25.121	4	"	"	772.5
24.80	24.853	5	"	"	773.5
—	24.446	3	"	"	774.7
22.34	22.319	3	"	"	781.4
05.20	05.187	5	"	4.9	835.7
04.91	04.875	2	"	"	836.7
04.44	04.443	5	"	"	838.1
01.63	01.627	2	"	"	847.0
—	5598.047	2	"	"	858.5
—	94.731	2	"	"	869.1
5593.22	93.208	3	"	"	873.9
92.67	92.670	6	"	"	875.6

VANADIUM—*continued.*

Arc Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison		$\lambda +$	$\frac{1}{\lambda} -$	
5588.71	5588.713	3	1.52	4.9	17888.3
86.26	86.232	4	"	"	896.2
85.00	84.979†	3? V	"	"	900.2
84.75	84.745	5	"	"	901.0
—	84.602	4	"	"	901.5
—	76.752	4	"	"	926.7
—	67.702	4	"	"	955.8
—	66.156	4	"	"	960.8
61.92	61.897	4	"	"	974.5
59.00	58.995	4	"	"	983.9
57.71	—	2	"	"	988.1
48.41	48.401	2	1.51	"	18018.3
47.31	47.306	5	"	"	021.9
46.18	46.165	4	"	"	025.6
—	45.101	4	"	"	029.0
—	42.954	4	"	"	036.0
—	35.659	4	"	"	059.8
—	35.082	4	"	"	061.7
—	34.056	4	"	"	065.0
—	17.437	4	"	"	119.4
—	15.301	4	"	"	126.5
11.41	11.413	3	1.50	"	139.3
—	08.865	4	"	"	147.6
07.97	07.744	5	"	"	151.0
—	06.097	4	"	"	156.8
05.13	05.097	3	"	"	160.0
5490.22	5490.181	3	"	5.0	209.3
88.18	88.312	4	"	"	215.7
87.48	87.455	3	"	"	218.3
71.56	71.563	2	1.49	"	271.3
68.05	68.032	2	"	"	283.1
64.30	—	2	"	"	295.6
58.39	—	4	"	"	315.4
—	55.031†	4	"	"	326.7
43.50	43.466	2	"	"	365.6
37.93	37.885	3	1.48	"	384.4
34.43	34.410	4	"	"	396.2
—	24.281†	2	"	"	430.6
21.96	—	2	"	"	438.5
20.32	—	2	"	"	444.1
18.33	18.318	5	"	"	450.9
15.51	15.479†	5	"	"	460.5
02.17	02.148	5	"	"	506.1
5398.13	—	3	1.47	5.1	519.8
88.56	5388.534†	3	"	"	552.8
85.39	—	4	"	"	563.7
83.68	83.651	4	"	"	569.6
—	53.619	4	1.46	"	673.8
—	38.812	2	"	"	725.7
30.65	30.616	2	"	"	754.4
29.05	—	2	"	"	760.0
02.40	—	2	1.45	5.2	854.2
5287.88	—	2	1.44	"	906.0

† 5455.02 Ruthenium.

† 5424.274, 5415.43 iron.

VANADIUM—*continued.*

Arc Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison		$\lambda +$	$\frac{1}{\lambda} -$	
5282.75	—	2	1.44	5.2	18924.3
72.92	—	2	"	"	959.7
71.28	5271.119	2	"	"	965.8
66.33	—	2	"	"	983.4
61.20	61.149	2	"	"	19002.0
60.56	60.527	2	"	"	004.3
—	58.308	2	"	"	012.3
41.06	41.055	4s	1.43	"	074.9
40.40	40.364	2	"	"	077.4
34.31	34.249	4s	"	"	099.6
33.91	33.895	2	"	"	101.0
25.97	25.920	3	"	"	131.7
16.80	16.772	3	"	"	163.7
13.87	13.837	2	"	"	174.5
12.47	12.399	2	1.42	"	179.7
07.89	07.844	2	"	5.3	196.4
06.82	06.790	2	"	"	200.3
—	00.520	4	"	"	223.5
—	5197.215	4	"	"	235.8
5195.58	95.564†	4	"	"	241.9
95.01	95.021	4	"	"	243.9
93.82	93.795	4	"	"	248.3
93.18	93.184† ? V	4	"	"	250.7
92.22	92.193	2	"	"	254.3
83.07	83.033	2	"	"	288.4
81.01	80.926	2	"	"	296.1
79.35	79.275	2	"	"	302.2
78.75	78.733	2	"	"	304.4
77.03	76.956	4	"	"	310.9
—	76.683	2	"	"	312.1
—	74.714	2	1.41	"	319.4
72.35	72.284	2	"	"	328.4
70.15	70.114	2	"	"	336.6
—	69.126	2	"	"	340.3
67.04	66.961	2	"	"	348.3
65.14	65.072	2	"	"	355.3
59.56	59.520	4	"	"	376.3
—	59.438	2	"	"	376.6
57.27	—	2	"	"	384.8
48.95	48.893	4	"	"	416.3
39.74	39.704	4	"	"	451.0
38.58	38.597	4	"	"	455.3
—	37.772	2	1.40	"	458.4
28.71	28.705	5	"	"	492.8
05.37	05.324	3	"	5.4	581.9
5064.32	5064.296	3	1.39	"	740.6
60.91	60.831	2	1.38	"	754.0
—	51.781	2	"	"	789.6
—	47.484	2	"	"	806.5
14.83	14.811	2	1.37	5.5	935.4
02.54	02.505	4	"	"	984.4
4943.04	—	3	1.35	5.6	20224.9
33.82	4933.786	2	"	"	262.8



## VANADIUM—continued.

Arc Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison		$\lambda +$	$\frac{1}{\lambda} -$	
*4932.24	4932.212†	4	1.35	5.6	20269.2
* 25.83	25.837	5	"	"	295.9
* 22.60	22.543	3	"	"	309.0
—	19.171	2	"	"	323.0
* 6.48	16.436	3	1.34	"	334.2
—	13.277	2	"	"	347.4
08.92	08.882	2	"	"	365.6
—	07.046	2	"	"	373.2
* 06.06	—	2	"	"	376.4
* 05.10	05.050	3	"	"	381.3
* 04.59	04.575†	6	"	"	383.5
* 00.84	00.820	5	"	"	399.1
*4894.43	4894.396	4	"	"	425.9
* 91.81	91.767	4	"	"	436.8
* 91.43	91.414	3	"	"	438.4
* 90.32	90.265	3	"	"	443.1
* 87.02	86.990	4	"	"	456.8
* 85.86	85.827	4	"	"	461.7
—	*82.359	4	"	"	476.3
* 81.75	81.745†	5	"	"	478.9
* 80.77	80.746	5	"	"	483.0
* 75.66	75.674†	8	1.33	"	504.4
—	73.170	2	"	"	514.9
* 71.46	71.453	4	"	"	522.1
—	70.334	2	"	"	526.9
* 64.93	64.943	8	"	"	549.7
* 62.83	62.801†	4	"	"	558.6
* 59.34†	—	4	"	5.7	573.2
—	*58.809	4	"	"	575.5
—	*57.241	2	"	"	582.1
—	54.114	2	"	"	595.3
—	52.155	2	"	"	603.7
* 51.65	51.686†	8	"	"	605.8
—	49.458	2	"	"	615.2
—	49.262	2	"	"	616.0
* 48.98	49.004	3	"	"	617.1
—	*46.799	2	"	"	626.5
* 43.16	43.195	3	"	"	641.9
—	35.040	2	1.32	"	676.6
—	34.264	2	"	"	679.9
—	*34.005	2	"	"	681.1
* 33.17	33.213	4	"	"	684.5
* 32.59	32.617†	6	"	"	687.1
* 31.80	31.836†	7	"	"	690.4
* 30.86	30.879	3	"	"	694.5
—	29.427	2	"	"	700.7
* 29.00	29.008	3	"	"	702.5
* 27.62	27.638†	7	"	"	708.4
—	23.031	2	"	"	728.1

\* Observed also by Lockyer and Baxandall, whose numbers are : 4932.23, 25.87, 22.60, 16.46, 08.90, 06.05, 05.05, 04.60, 00.82, 4894.42, 94.74, 91.40, 90.30, 87.03, 85.89, 82.36, 81.75, 4880.82, 75.71, 71.50, 64.92, 62.83, 59.38, 58.80, 57.20, 51.69, 49.05, 46.80, 43.20, 34.00, 33.24, 32.61, 31.85, 30.90, 29.00, 27.63.

## VANADIUM—continued.

Arc Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison		$\lambda +$	$\frac{1}{\lambda} -$	
*4819.22	4819.225	3	1.32	5.7	20744.5
—	*08.842	2	"	"	789.3
* 07.70	07.736†	7	"	"	794.2
—	*03.240	2	1.31	"	813.6
—	02.373	2	"	"	817.3
*4799.94	4799.972†	4	"	"	827.8
* 99.20	99.210	2	"	"	831.0
* 98.12	98.151	3	"	"	835.7
* 97.07	97.119†	6	"	"	840.2
* 95.27	95.293	4	"	"	848.1
—	94.730	2	"	"	850.5
* 93.10	93.135	4	"	"	857.6
—	89.103	2	"	"	875.0
* 86.70	86.706†	6	"	"	885.5
* 84.65	84.663	4	"	"	894.4
—	81.514	2	"	5.8	908.2
* 76.70†	76.644	4	"	"	929.3
* 76.54†	—	6	"	"	929.8
* 73.25	73.263	3	"	"	944.2
* 72.74	72.781	2	"	"	946.4
—	69.208	2	"	"	962.0
* 66.80	66.838†	5	1.30	"	971.6
* 65.84	65.859	3	"	"	976.8
—	*64.224	2	"	"	984.0
—	*59.210	2	"	"	21006.1
* 57.68	57.686	5	"	"	012.8
* 57.55	—	4	"	"	013.4
* 54.13	—	5	"	"	028.5
—	*52.036	2	"	"	037.8
* 51.75	51.759	4	"	"	039.1
* 51.45	51.463	2	"	"	040.4
* 51.16	51.211	4	"	"	041.6
* 48.70	48.723	4	"	"	052.5
* 47.30	47.313	3	"	"	058.8
* 46.81	46.827	4	"	"	060.9
* 42.79	42.819	4	"	"	078.8
* 39.79	39.849	2	"	"	092.1

\* Lockyer and Baxandall, 4819.23, 08.84, 07.73, 03.24, 4799.98, 99.20, 98.19, 97.08, 95.35, 93.15, 86.71, 84.72, 76.63, 73.29, 72.76, 66.82, 65.91, 64.22, 59.20, 58.95, 57.62, 54.13, 52.05, 51.79, 51.45, 51.18, 48.70, 47.30, 46.87, 42.86, 39.80.

VANADIUM—*continued.*

" Signifies that the line is double; b<sup>v</sup> that the line is sharply defined on the violet side and nebulous towards the red; and b<sup>r</sup> means that it is sharp on the less refracted side and nebulous towards the violet.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
* 4738.51	4738.505		3		1.30	5.8	21097.9
* 37.91	37.924		2		"	"	100.5
* 32.12	32.108		3		"	"	126.4
* 31.74	31.745		3		"	"	128.1
* 31.42	31.443		3		"	"	129.5
* 30.57	30.574		4		"	"	133.3
* 29.73	29.724		4		1.29	"	137.1
* 28.85	28.840		2		"	"	141.0
	* 24.075		2		"	"	162.3
* 23.65	23.626		2		"	"	164.3
* 23.06	23.055		5		"	"	166.9
* 21.70	21.704		5		"	"	173.0
* 21.42	21.444		3		"	"	174.2
* 17.85	17.874		5		"	"	190.3
* 16.36	16.377		3		"	"	197.0
* 16.08	16.079		4		"	"	198.3
* 15.61	15.650		3		"	"	200.3
	* 15.488 Ti		2		"	"	200.9
* 14.28†			5		"	"	206.4
* 13.61	13.639		3		"	"	209.3
* 10.74	10.746		5		"	"	222.3
	09.130		2		"	"	229.5
	08.397		2		"	"	232.8
* 07.62†	07.629		4		"	5.9	236.3
* 06.75†	06.761		5		"	"	240.2
* 06.34	06.357		5		"	"	242.0
* 05.26	06.278		4		"	"	246.8
	* 02.689		2		"	"	258.5
4699.52†	4699.505		4		"	"	272.9
* 90.45	90.438		2		1.28	"	314.0
* 88.24			2		"	"	324.1
* 87.10	87.100		5		"	"	329.3
* 84.64	84.634		4		"	"	340.5
†82.09 ? V			2		"	"	352.1
* 81.07†	81.073		3		"	"	356.7
* 79.95	79.961		3		"	"	361.8
* 79.65			2		"	"	363.2
* 73.83	73.836		2		"	"	389.8
* 72.48†V			2		"	"	396.0
* 70.66	70.666	4670.65	8	8	"	"	404.3
* 69.50†	69.487		2	—	"	"	409.7
* 66.33†		66.32	4	2	"	"	424.2
	63.314	63.07	6	2	"	"	439.2
	* 62.605						
62.02			2		"	"	444.0
* 61.01			2		"	"	448.7
* 57.17†	57.138	57.15	2	2n	"	"	466.5

\* Lockyer and Baxandall, 4738.60, 37.90, 32.17, 31.80, 31.40, 30.58, 29.77, 28.85, 24.07, 23.65, 23.06, 21.71, 21.40, 17.89, 16.39, 16.11, 15.62, 15.50, 14.29, 13.65, 10.75, 07.64, 06.76, 06.38, 05.23, 02.70, 4690.45, 88.24, 87.11, 84.57, 81.12, 80.03, 79.68, 73.83, 72.48, 70.66, 69.50, 66.34, 62.60, 62.00, 61.00, 57.17, also lines at 4709.93 and 4682.93.



## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
* 4655.47	4655.410	4656.65		2n	1.28	5.9	21468.8
* 54.84		55.43	2	2	"	"	474.3
* 53.15	53.106	53.15	3		1.27	"	477.1
* 49.08†	49.068	49.05	2	2n	"	"	485.0
* 48.08	48.046		3	2	"	"	503.8
* 46.59	46.571	46.58	2		"	"	508.4
* 46.17	46.156		5	6	"	"	515.7
* 44.64	44.624	44.67	2		"	"	517.2
	* 44.239	44.25	4	2	"	"	524.3
* 40.92	40.916	40.91	3		"	"	526.1
* 40.25	40.232	40.23	4	2	"	"	541.6
* 36.34	36.343	26.33	4	4	"	"	544.7
* 35.35	35.346	35.34	3	2	"	"	562.8
		34.4	5	4	"	"	567.5
				2	"	6.0	572
* 30.24	30.236		2		"	"	591.2
* 26.67†	26.666	26.67	4	4	"	"	607.9
* 24.62	24.581	24.60	4	4	"	"	617.5
* 21.43	21.426		4		"	"	632.3
19.97 }		19.93	2		"	"	639.3
* 19.85 }	19.896		5	10	"	"	639.7
		* 19.0	4		"	"	644
		18.7		2n	"	"	645
* 18.00		18.03		2n	"	"	648.3
		17.48	2	2	"	"	650.8
* 17.03		17.02	2	2	1.26	"	653.0
* 16.18	16.190	16.20	2	2	"	"	656.9
* 14.08†?V	14.094		2		"	"	666.8
	13.076				"	"	667.3
* 11.92		11.94	"		"	"	676.9
* 11.10	11.103	11.13	4	2	"	"	680.7
* 09.84	09.821	09.82	3	2	"	"	686.8
	08.635		4	4	"	"	692.4
* 07.40	07.390	07.47	"		"	"	698.2
* 06.33	06.321	06.34	3	2	"	"	701.2
		05.53	5	6	"	"	707.0
* 00.34		00.40	2		"	"	731.4
* 4594.27†	4594.216	4594.31	3	10b <sup>v</sup>	"	"	760.2
* 91.39	91.406	91.41	9	12	"	"	773.3
		90.63	5	8	"	"	777.5
		89.05		2	"	"	785.0
* 88.94		88.88		2	"	"	785.7
* 86.54†	86.554	86.55	2	2	"	"	796.9
* 86.15		86.10	9	12	"	"	798.9
* 83.96	83.967	83.41	3	2	"	"	809.2
	* 81.409	81.36	4	4	"	"	821.5
* 80.57†	80.562	80.60		2	"	"	825.3
* 79.38	79.373	79.32	8	10b <sup>v</sup>	1.25	"	831.1
* 78.92	78.908	78.90	5	4	"	"	833.3
* 77.36†	77.348	77.35	6	6	"	"	840.7
* 71.96	71.959	72.00	8	10	"	"	866.4
			6	10b <sup>v</sup>	"	"	

\* Lockyer and Baxandall, 4655.50, 54.80, 53.13, 49.07, 48.08, 46.52, 46.20, 44.66, 44.24, 40.92, 40.27, 36.36, 35.38, 30.25, 26.66, 24.61, 21.42, 19.92, 19.00, 18.00, 17.00, 16.20, 14.10, 11.95, 11.11, 09.84, 07.42, 06.33, 00.41, 4594.27, 91.41, 88.97, 86.51, 86.20, 83.96, 81.40, 80.57, 79.38, 78.89, 77.33, 71.97.



## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda -}$	
* 4570.60		4570.57	4	4	1.25	6.0	21873.0
		69.4		2	"	"	879
		67.40		2	"	"	888.3
* 64.76	4564.756	64.80	2	12	"	"	900.9
		63.95		2	"	6.1	904.7
		63.55		2	"	"	906.7
* 60.90	60.893	60.90	6	12	"	"	919.4
		58.60		2n	"	"	930.5
		56.95		2n	"	"	938.6
		55.53		2	"	"	945.2
* 53.25		53.22	5	8b <sup>v</sup>	"	"	956.3
	52.735	52.67		2	"	"	958.9
* 52.05	52.016	51.99	4	2	"	"	962.1
* 49.81†	49.824	49.85	6	12	"	"	972.8
		47.97		2	"	"	981.8
* 45.57	45.566	45.60	7	14	"	"	993.3
* 41.57		41.5	2	2b	1.24	"	22012.9
* 40.18	40.179	40.18	4	4	"	"	019.5
* 37.84†	37.834	37.80	4	4	"	"	030.9
		36.1	6	2b	"	"	039.3
		35.73		2	"	"	041.1
		35.4		2n	"	"	042.7
		34.94		2	"	"	044.9
	* 34.107	34.11	6	4	"	"	049.0
* 30.97	30.972	30.95	4	2	"	"	064.3
* 29.76		29.73	5	4	"	"	070.2
* 29.47	29.476	29.45	4	2	"	"	071.6
* 28.66		28.69	4	8	"	"	075.4
* 28.16	28.168	28.12	5	4	"	"	078.0
* 25.31†	25.337	25.31	4s also Fe	4	"	"	091.7
* 24.38	24.378	24.41	6	6	"	"	096.3
		23.97		2n	"	"	098.4
		22.32		2	"	"	106.5
		20.70		2	"	"	114.4
* 20.67	20.685	20.63	3n	2	"	"	114.7
* 20.31	20.331	20.32	4n	2''	"	"	116.2
* 17.77†	17.738	17.70	4	4	"	"	128.9
		16.85		2n	"	"	133.2
		16.21		2n	"	"	136.3
* 15.74	15.729	15.71	3	2	"	"	138.7
* 14.36†	14.357	14.37	5 also Fe, Co	4	"	"	145.4
	13.79	13.792	4	2	"	"	148.2
		12.92		6n	"	"	152.5
* 11.64	11.605	11.60	4	2	"	"	158.9
* 09.49†	09.463	09.46	4	2	"	"	169.5
		08.44		2n	"	"	174.5
* 08.11		08.05	2	2	"	"	176.4
* 06.77†	06.744	06.75	4	2	"	"	182.9

\* Lockyer and Baxandall, 4570.62, 64.79, 60.89, 53.25, 52.03, 49.79, 45.56, 41.60, 40.18, 37.83, 34.08, 30.98, 29.78, 29.50, 28.64, 28.19, 4525.33, 24.39, 20.71, 20.35, 17.75, 15.73, 14.36, 13.83, 11.63, 09.46, 08.10, 06.73, 06.40, also lines at 4603.15, 4555.59.

## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
* 4506.41		4506.40	3	2	1.24	6.0	22184.6
* 06.30		06.27	4	2	"	"	185.0
* 02.12	4502.121	02.19	6	6b <sup>v</sup>	1.23	"	205.6
		* 01.44		2	"	"	209.0
* 01.01	01.001	01.00	4n	2	"	"	211.2
		4499.97		2	"	"	216.3
		98.28		2	"	"	224.6
		97.88		2	"	"	226.6
* 4497.57	4497.574	97.57	4	4	"	6.2	228.0
* 97.03†		97.03	4	4	"	"	230.7
* 96.26	96.233	96.30	6	6b <sup>v</sup>	"	"	234.6
* 95.16		95.18	3	2n	"	"	239.8
		92.47		2	"	"	253.3
* 91.66	91.648	91.66	2	2	"	"	257.3
* 91.35	91.343	91.35	3s	2	"	"	258.8
* 90.95†	90.981	90.99	5s	4	"	"	260.7
		90.3		2n	"	"	264.0
* 89.06†	89.096	89.11	7	16b <sup>v</sup>	"	"	270.0
		88.46		2	"	"	273.1
* 6.44		86.43	2	2	"	"	283.2
		85.9		2n	"	"	285.9
		83.76	5s	2n	"	"	296.5
* 80.20	80.206	80.26		4b <sup>v</sup>	"	"	313.9
		* 77.46		2	"	"	327.9
		76.06	4	2	"	"	334.9
		75.85		2	"	"	335.9
* 74.89	74.899	74.93	7	10	"	"	340.7
* 74.21	74.207	74.28	6	10	"	"	344.1
		* 73.43		2	"	"	348.0
		72.53		2	"	"	352.5
		* 71.94		2	"	"	355.5
		* 71.50		2	"	"	357.7
	70.827 {	71.00	2	2	"	"	360.2
		70.60		2n	"	"	362.2
* 69.88	69.871	69.92	7	12b <sup>v</sup>	"	"	365.8
* 68.94	68.931	68.94	4	4	1.22	"	370.5
* 68.19	68.174	68.20	5	6b <sup>v</sup>	"	"	374.2
		* 67.78		2	"	"	376.3
* 67.04		67.05	4	2	"	"	379.9
	* 65.675	65.67	6	4	"	"	386.8
		* 64.95		4	"	"	390.5
		* 64.49		6b <sup>v</sup>	"	"	392.8
		63.30		2	"	"	398.7
* 62.56	62.533	62.60	7 see Ni	14	"	"	402.3
	60.849	61.20	8	4b <sup>v</sup>	"	"	411.1
* 60.46†	60.462	60.52	9	12b <sup>v</sup>	"	"	413.0
* 59.93†	59.918	59.98	8	14	"	"	415.6
	58.915		2		"	"	420.8
		* 58.57	2	2	"	"	422.5
* 57.97†		57.98	5	6b <sup>v</sup>	"	"	425.5

\* Lockyer and Baxandall, 4506.30, 02.12, 01.45, 01.00, 4497.55, 97.00, 96.24, 95.17, 91.65, 91.36, 90.99, 89.08, 86.39, 80.21, 77.48, 74.91, 74.22, 73.45, 71.96, 71.51, 69.87, 68.95, 68.23, 67.87, 67.09, 65.69, 64.95, 64.46, 62.52, 60.52, 59.96 58.57, 58.00, and also 4484.24, 61.18.

VANADIUM—*continued*.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
* 4457·65†	4457·632	4457·65	7	6	1·22	6·2	22427·1
* 56·68	56·668	56·72	4	4n	"	"	432·0
	56·073	56·07 Ca	2	2	"	"	435·1
		55·52		2	"	"	437·9
	54·939	54·96 Ca	2	4	"	"	440·7
		* 54·32		2	"	"	443·9
		53·53		4	"	"	447·9
		* 53·37		2n	"	"	448·7
		52·90		4	"	"	451·1
* 52·91	52·180	52·23	4	14	"	"	454·6
* 52·19	51·070	51·11	8	6b <sup>v</sup>	"	"	460·2
* 51·09†	49·741	49·76	4	4	"	"	466·9
* 49·77		* 45·99	5	2	"	"	486·0
* 44·40†	44·380	44·42	7 also Ti	10	"	"	494·0
		43·50	4	8	"	"	498·5
* 43·52	43·508	42·53		2	"	"	503·5
* 41·88†	41·847	41·90	7 also Ti	14	"	"	506·7
		40·65		2n	"	"	513·0
		* 39·16		2	"	"	520·6
* 38·02†	38·004	38·08	7	12b <sup>v</sup>	"	"	526·2
		37·50		2	"	"	529·0
		37·00		2	"	"	531·6
* 36·31†	36·309	36·34	7	10	"	"	535·2
		35·84		2	"	"	537·4
		* 35·53		2	"	"	539·0
		35·0		2b	"	"	541·7
* 34·80		34·74	4	4	"	"	542·9
		* 33·07		2	"	6·3	551·5
		30·72	4	4	1·21	"	563·5
* 30·68		29·99	6	8b	"	"	567·2
* 29·95		28·71	6	8	"	"	573·7
* 28·68†	28·676	* 27·50		8	"	"	579·8
		26·23	6	8	"	"	586·4
* 26·17†		25·88	4	4	"	"	588·1
* 25·86†		25·60	2	2	"	"	589·5
	25·594 Ca	24·75	3	4	"	"	594·9
* 24·74†	24·743	24·11	3	4	"	"	597·2
* 24·10	24·082	23·40	3	6	"	"	600·7
* 23·41	23·375		3		"	"	601·7
* 23·22		22·43	3	2	"	"	605·8
* 22·40†		21·82	6	8	"	"	609·1
* 21·73†	21·739	20·19	5	4b <sup>v</sup>	"	"	617·4
* 20·08		16·9		4n	"	"	634·0
		16·63	6	4	"	"	635·4
* 16·63†	16·626	* 14·74		2	"	"	645·1
		* 13·87		2	"	"	649·6
		12·38	4s	4b <sup>v</sup>	"	"	657·4
* 12·30	12·299	11·83		2	"	"	660·0
* 08·67†	08·655	08·68	9	14rb <sup>v</sup>	"	"	676·3

\* Lockyer and Baxandall, 4457·67, 56·68, 54·34, 53·30, 52·91, 52·19, 51·13, 49·78, 46·04, 44·39, 43·56, 41·90, 39·19, 38·02, 36·33, 35·60, 34·80, 33·09, 30·71, 30·02, 28·72, 27·49, 26·22, 25·95, 24·77, 24·11, 23·40, 22·42, 21·77, 20·14, 16·71, 14·74, 12·33, 08·67.



## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\lambda -$	
* 4408.36†	4408.368	4408.40	8	10	1.21	6.3	22677.8
* 07.85†	07.801	07.89	9	12	"	"	680.5
* 06.80†	06.805	06.90	9	12	"	"	685.8
	* 06.277	06.35	8	6	"	"	688.4
* 05.20†		05.19	5s	4	"	"	694.2
		04.45		2	"	"	698.0
* 03.86	03.831	03.83	3	4	"	"	701.2
		01.95		2	"	"	710.9
* 00.74†	00.738	00.80	8	18	"	"	717.1
		*4399.60		2	"	"	723.0
		98.70		2n	"	"	727.7
		* 98.05		2	"	"	731.0
	4397.392	97.55	2	2	"	"	734.0
		* 97.00		2n	"	"	736.5
* 4395.40†	95.382	95.49	9	20	"	"	744.6
* 94.98†		94.99	3	4	"	"	746.9
* 94.01†	94.000	94.03	4	4	"	"	751.9
* 93.26	93.258	93.30	4	4	1.20	"	755.8
* 92.24†	92.234	92.27	4	4	"	"	761.1
* 91.84		91.86	3	2	"	"	763.2
* 90.79		90.81	2	2	"	"	768.6
* 90.13†	90.142	90.23	9r	30	"	"	771.9
		89.27		2	"	"	776.5
* 87.40		87.37	3	4	"	"	786.3
* 84.87†	84.875	84.88	9	40r	"	"	799.4
* 84.37		84.35	2	2	"	"	802.0
* 84.07			2		"	"	803.3
		82.96		2	"	"	809.3
		* 81.94		2	"	"	814.6
	* 81.187	81.20	2	2n	"	"	818.5
* 80.69	80.719	80.72	4	4	"	"	821.1
* 79.38†	79.392	79.40	9r	40r	"	"	827.9
* 79.06		78.02	4n	2	"	"	835.0
		* 76.9		2b	"	"	840.9
* 25		76.19	2	2	"	"	844.5
* 75.47†		75.47	4	4	"	"	848.4
		* 75.21		2	"	"	849.7
* 73.99†	73.984	73.99	4	4	"	"	856.1
* 73.40†	73.383	73.42	4	6b <sup>v</sup>	"	"	859.2
		70.45		2n	"	"	874.6
* 69.25		69.22	2	2	"	"	881.1
* 68.76†	68.756	68.73	3	4	"	"	883.6
* 68.25†		68.19	4	6	"	6.4	886.2
		67.74		2	"	"	888.7
* 67.24		67.07	2	4n	"	"	891.8
* 65.92		65.89	3	2	"	"	898.4
* 64.37†	64.377	64.36	4	4b <sup>v</sup>	"	"	906.4
* 63.69	63.690	63.69	4	4	"	"	910.0
* 63.48†		63.49	2	2	"	"	911.1

\* Lockyer and Baxandall, 4408.35, 07.83, 06.80, 06.33, 05.20, 03.87, 00.74, 4399.63, 98.09, 96.93, 95.42, 95.05, 94.03, 93.28, 92.28, 91.88, 90.80, 90.13, 87.42, 84.92, 84.42, 84.13, 81.93, 81.21, 80.75, 79.44, 78.13, 77.05, 76.25, 75.51, 75.28, 74.01, 73.40, 69.24, 68.78, 68.23, 67.26, 65.94, 64.40, 63.75, 63.54, also 4432.28, 31.91, 31.36, 22.71, 18.88, 17.83, 15.25, 13.90, 13.60, 02.79, 01.91, 01.34, 4397.56, 96.61, 95.77.



VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
* 4361.57		4361.55	3	4	1.20	6.4	22921.2
* 61.18		61.17	2	2	"	"	923.2
* 60.75		60.76	3	4	"	"	925.4
		60.30		2	"	"	927.8
* 57.82		57.75	2	2n	"	"	941.0
* 57.60		57.61	3	2	"	"	942.0
		* 56.97		2	1.19	"	945.3
* 56.10†	4356.104	56.16	5	4b <sup>v</sup>	"	"	949.8
* 55.09	55.138	55.18	4	4b <sup>v</sup>	"	"	955.0
		* 53.52		2	"	"	963.5
* 53.02†	53.040	53.10	7	12	"	"	966.0
		* 52.60		2	"	"	968.4
		* 50.99		2	"	"	976.9
		* 50.85		2	"	"	977.6
		50.15		2	"	"	981.3
		* 47.07		2n	"	"	997.6
		46.60		2n	"	"	23000.1
* 43.00		43.01	4	4	"	"	019.1
* 42.36		42.37	3	2	"	"	022.5
* 41.15†	41.162	41.21	6	14b <sup>v</sup>	"	"	028.9
		* 39.30		2n	"	"	038.8
		38.12		2	"	"	045.1
* 36.29		36.29	3	4	"	"	054.8
		* 35.64		2	"	"	058.2
		* 35.03		2	"	"	061.5
* 34.23		34.26	3	4	"	"	065.6
* 32.98†	32.985	33.05	6	12	"	"	072.4
* 32.56		32.46	3	2	"	"	077.7
		31.73		2	"	"	079.1
* 30.18†		30.28	3	12b <sup>v</sup>	"	"	084.4
		27.26		2	"	"	102.9
		25.40		2	"	"	112.8
		24.80		2	"	"	116.2
		23.68		2	"	"	122.0
* 22.51		22.52	2	2	"	"	128.3
		22.20		2	"	"	130.0
* 20.46		20.45	2	2	"	"	139.3
		* 20.13		2	"	"	141.1
	18.803	18.81		2	1.18	"	148.1
		16.4		2n	"	"	161.1
* 16.02		15.98	2	2	"	"	163.2
		* 15.00		2	"	"	168.6
* 14.06		14.07	3	4	"	"	173.6
		13.50		2n	"	"	176.6
		13.06		2	"	"	179.0
* 12.56		12.56	2	2	"	"	181.7
		* 11.85		2n	"	"	185.5
		* 11.62		2	"	"	186.7
* 09.95	09.949	10.00	6	8	"	"	195.7

\* Lockyer and Baxandall, 4361.58, 61.24, 60.77, 57.86, 57.64, 56.98, 56.14, 55.14, 53.54, 53.02, 52.68, 50.97, 50.86, 47.02, 43.02, 42.39, 41.19, 39.31, 36.33, 35.69, 35.06, 34.25, 32.96, 30.18, 22.53, 20.49, 20.15, 15.95, 15.02, 14.11, 12.58, 11.83, 11.66, 09.95, also 4388.32, 85.53, 83.29, 81.43, 77.33, 74.38, 71.98, 66.76, 47.64, 45.39, 31.28, 29.90.

## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
* 4309.69		4309.68	3	2	1.18	6.4	22197.2
		* 08.60		2	"	6.5	202.9
* 07.33		07.37	5	6	"	"	209.6
* 06.35		06.39	5	4	"	"	214.9
		06.07		2	"	"	216.5
		* 05.61		4	"	"	219.0
		04.98		2	"	"	222.4
		04.3		2n	"	"	226.1
* 03.70	4303.697		4		"	"	229.3
		02.69 Ca?		4	"	"	234.8
		* 02.31		2	"	"	236.8
		01.33		4b <sup>v</sup>	"	"	242.1
		00.73		2	"	"	245.4
		00.25		2n	"	"	247.9
	* 4299.240	4299.13	2	2	"	"	253.7
		* 98.80		2	"	"	255.8
* 4298.17†		98.23	5	8	"	"	259.0
* 97.86	97.840	97.87	5	8	"	"	260.9
		* 97.26		2	"	"	264.1
* 96.28	96.266	96.31	5	10	"	"	269.4
* 91.97	91.978	92.01	6	10b <sup>v</sup>	"	"	292.8
* 91.46		91.46	4	4	"	"	295.6
		91.13		2n	"	"	297.3
		90.45		2n	"	"	301.1
		89.87 Cr?		2	"	"	304.2
		89.51		2	"	"	306.2
		* 88.96		2	"	"	309.2
* 87.97		87.98	4	4b <sup>v</sup>	"	"	314.5
* 86.57		86.57	4	4	"	"	322.2
		86.24		2n	"	"	323.9
		85.60		2	"	"	327.4
* 84.19	84.208	84.25	6	12	"	"	335.0
* 83.06		83.10	4	6	"	"	341.2
* 79.12		79.10	3	10	1.17	"	362.9
* 77.12†	77.101	77.14	6	12	"	"	373.7
		* 76.47		2	"	"	377.3
		74.96 Cr?		2	"	"	385.5
		* 73.54		2	"	"	393.3
		* 72.90		2n	"	"	396.8
* 71.71	71.706	71.68	6	4	"	"	403.4
* 70.49		70.5	4	4b <sup>v</sup>	"	"	410.0
* 69.92†		69.91	4	4	"	"	413.2
* 68.78†	68.787	68.83	6	14	"	"	419.3
		68.60		2	"	"	423.7
* 67.50†		67.55	3	4n	"	"	426.3
* 65.28		65.31	4b	4	"	"	438.5
		64.65		2n	"	"	442.1
		64.0C		2	"	"	445.7
* 62.32	62.311	62.32	4	6b <sup>v</sup>	"	"	454.9
* 61.37†		61.4	4	2n	"	"	460.0

\* Lockyer and Baxandall, 4309.75, 08.61, 07.32, 06.40, 05.64, 03.70, 02.32, 4299.27, 98.79, 98.17, 97.85, 97.29, 96.30, 91.96, 91.45, 89.00, 87.93, 86.57, 84.19, 83.08, 79.12, 77.10, 76.50, 73.50, 72.93, 71.75, 70.51, 69.89, 68.78, 67.48, 65.25, 62.30, and also 4318.04, 06.76, 4278.53, 66.07, 61.32.

VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda}$	
		4260.90		2	1.17	6.5	22462.7
		* 60.47		2n	"	"	465.1
		* 60.31		2n	"	"	466.0
* 4259.46+	4259.454	59.46	4s	4	"	"	470.7
* 57.53†	57.517	57.54	4s	4	"	"	481.9
		57.17		2	"	"	483.3
* 55.60		55.63	3	2	"	"	491.8
		54.51 Cr?		4b <sup>v</sup>	"	"	498.0
* 53.02		53.00	3	2	"	"	506.3
* 51.45		51.45	2	2	"	6.6	514.8
		49.49		2	"	"	525.6
		48.96		2	"	"	528.6
* 47.46		47.5	2	2b	"	"	536.7
		* 46.83		2	"	"	540.4
		43.98		2	1.16	"	556.2
		43.02		4	"	"	561.5
* 41.48		41.45	4	4	"	"	570.3
* 40.53†		40.51	4	2	"	"	575.5
* 40.25†		40.23	4	2	"	"	577.0
* 39.12			3		"	"	583.2
		36.99		2	"	"	595.1
		* 36.78		2	"	"	596.2
* 35.90†	35.909		5		"	"	601.1
		35.47		4	"	"	603.5
* 34.70†	34.671	34.71	5	4	"	"	607.9
		34.3		2n	"	"	610.1
* 34.12	34.149	34.17	6	4	"	"	610.9
* 33.09†	33.007	33.12	6	4	"	"	616.9
* 32.62†	32.604	32.66	6	6	"	"	619.4
		32.20		6	"	"	621.8
		31.30		2	"	"	626.8
* 29.87		29.82	4	6	"	"	635.1
* 27.90†		27.90	4	4	"	"	645.8
	26.871	26.85 Ca?	8	10	"	"	651.7
			4		"	"	652.1
* 26.78					"	"	659.9
* 25.40†	25.369	25.40	2	8n	"	"	663.7
		24.70		2	"	"	665.9
* 24.30		24.32	4	4	"	"	675.5
		22.77		2	"	"	676.1
* 22.49		22.50	2	2	"	"	683.3
* 21.17		21.20	2n	2n	"	"	686.9
		20.21		4	"	"	691.9
* 19.65		19.70	3	2	"	"	696.8
* 18.86†		18.87	4s	4	"	"	697.7
		18.65		2	"	"	700.2
		18.20		2	"	"	709.7
* 16.52		16.53	2	2	"	"	713.9
		15.77 Sr?		2	"	"	723.1
		14.12		2n	"	"	724.9
		13.8		2n	"	"	728.5
		13.17		2n	"	"	

\* Lockyer and Baxandall, 4260.46, 60.28, 59.47, 57.50, 55.59, 53.00, 51.42, 47.43, 46.91, 41.52, 40.54, 40.29, 39.15, 36.78, 35.92, 34.71, 34.18, 33.09, 32.68, 29.92, 27.92, 25.41, 24.36, 22.54, 21.22, 19.66, 18.89, 16.50.



## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda}$	
4211.02		4211.02	2	2n	1.16	6.6	23740.6
10.55			2		"	"	743.3
* 09.98†	4210.002	10.02	5	12	"	"	746.4
* 05.23†	05.201	05.30	2	16	1.15	"	773.4
* 04.67					"	"	776.5
		* 04.39	2	4	"	"	778.1
* 02.52	02.506	02.52	2	8	"	"	788.7
		* 01.08		2	"	"	796.8
* 00.35		00.38	4	2	"	"	800.9
		00.00		2n	"	6.7	802.8
* 4198.78†		4198.80	4s	4	"	"	809.6
* 97.77†		97.79	4s	4	"	"	815.4
* 97.45†		97.47	2	2	"	"	817.3
		* 95.8		2n	"	"	826.7
* 94.17		94.21	2	2	"	"	835.7
* 91.70		91.80	5	6b <sup>v</sup>	"	"	849.4
		91.11		4	"	"	853.3
		90.59		4	"	"	856.3
* 89.99	4190.011	90.03	5	6	"	"	859.6
* 87.82			2		"	"	872.1
* 86.95		86.93	2	2	"	"	877.1
* 83.59†		83.67	2	16	"	"	896.0
* 83.43	83.07		2		"	"	898.1
* 82.74	82.733	82.77	5	4	"	"	901.0
* 82.23		82.26	3	4	"	"	902.9
* 80.99†		81.03	2	2n	"	"	909.9
* 79.53		79.60	5	6	"	"	919.2
		79.22		2	"	"	921.2
		* 78.55		6	"	"	925.0
		* 77.75		2	"	"	928.6
* 77.25†		77.22	4	4	"	"	932.5
* 77.02			2		"	"	933.8
* 76.83			2		"	"	934.9
		76.00		2n	"	"	939.7
* 75.30†		75.30	2	2	"	"	943.7
		75.15		2	"	"	944.5
* 74.18†	74.155	74.19	4	4	"	"	949.1
* 71.45		71.46	4	4	"	"	965.8
* 69.40†		* 69.41	3	4	"	"	967.5
		* 69.06		2	"	"	979.5
		67.1		2b	1.14	"	990.8
		66.32		2	"	"	995.3
		64.60		4	"	"	24005.2
		63.82		2n	"	"	009.7
		62.52	2	2	"	"	017.2
* 62.51		62.2		2n	"	"	019.0
* 60.57		60.57	2	2	"	"	028.5
* 59.84†	59.822	59.87	5	6	"	"	032.7
* 58.14					"	"	042.5

\* Lockyer and Baxandall, 4210.00, 05.28, 04.67, 04.34, 02.50, 01.05, 00.30, 4198.74, 97.74, 97.43, 95.73, 94.13, 91.69, 89.95, 87.74, 86.91, 83.60, 83.45, 82.74, 82.21, 80.95, 79.54, 78.53, 77.67, 77.19, 77.00, 76.85, 75.24, 74.13, 71.42, 69.37, 69.08, 67.15, 62.48, 60.48, 59.82, 58.11, and also 4260.00, 39.80, 23.15, 06.73, 4199.97, 99.75.



## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda}$	
* 4156.00		4156.00	3	2''	1.14	6.7	24054.9
* 55.39			2		"	"	058.4
* 53.49		53.49	3	2	"	"	069.4
* 52.81		52.80	4	4	"	"	073.4
		52.3		2n	"	"	076.3
* 51.52		51.50	2	2	"	"	079.9
* 50.84		50.83	4	4	"	6.8	084.8
* 49.02		49.00	3	4	"	"	095.3
		* 47.85		2b <sup>v</sup>	"	"	102.1
* 43.02		43.07	2	2	"	"	130.0
* 42.75†		42.77	3	2	"	"	131.7
* 41.96		42.00	3	2	"	"	136.2
		* 41.51		2n	"	"	139.0
		40.22		2n	"	"	146.5
* 39.39		39.40	4	6	"	"	151.3
		* 38.27		4	"	"	157.9
		* 37.14		2b <sup>r</sup>	"	"	164.5
* 36.52		36.53	4	4	"	"	168.1
* 36.25		36.21	4	4	"	"	169.8
		* 35.40		2	"	"	174.7
* 34.61	4134.617	34.62	7	14	"	"	179.2
* 33.92		33.91	4	4	"	"	183.3
* 32.13†	32.123	32.15	7	16	"	"	193.8
* 31.32	31.297	31.32	2	2	"	"	198.6
		* 30.3		2b	1.13	"	204.5
* 29.00		28.99	4	6	"	"	212.2
* 28.25†	28.152 ?	28.25	7	16	"	"	216.5
		26.07		2	"	"	229.3
* 24.23	24.196	24.26	4	4	"	"	240.1
* 23.65†		23.70	6	8	"	"	243.4
		* 23.30		4	"	"	245.6
* 21.13		21.15	2	2	"	"	258.3
* 20.69	20.655	20.69	4	6	"	"	261.0
* 19.58†	19.575	19.60	4	6	"	"	267.5
		* 19.25		2	"	"	269.5
* 18.73			4		"	"	272.5
* 18.34	18.320	18.38	5	10	"	"	274.8
* 16.85†			3		"	"	283.6
* 16.64†	16.631	16.70	6	14	"	"	284.9
* 15.32†	15.311	15.38	7	16	"	"	292.5
* 14.69		14.68	3	4	"	"	296.4
* 13.65	13.637	13.66	5	8	"	"	302.5
* 12.47†		12.50	3	6	"	"	309.4
		* 12.10		8n	"	"	311.7
	11.916	* 11.8	8	8n	"	"	312.7
		* 10.93		2	"	"	318.6
* 09.94†	09.906	09.98	7	14	"	"	324.5
		* 09.19		2	"	"	328.9

\* Lockyer and Baxandall, 4155.95, 55.34, 53.47, 52.80, 51.46, 50.80, 50.22, 49.01, 47.90, 43.02, 42.80, 41.91, 41.50, 39.34, 38.17, 37.36, 37.06, 36.55, 36.27, 35.40, 34.61, 33.86, 32.08, 31.26, 30.28, 28.94, 28.20, 24.15, 23.59, 23.30, 21.08, 20.65, 19.56, 19.23, 18.76, 18.34, 16.64, 15.33, 14.69, 13.62, 12.50, 12.00, 11.22, 10.86, 09.89, 09.20, also 4184.55, 80.12, 66.86, 58.58, 56.65, 54.16, 46.15, 45.62, 43.47, 32.93, 31.07, 30.44, 27.56, 27.15, 22.94, 22.45, 21.75.

VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
* 4108.36		4108.38	4	6	1.13	6.8	24333.8
* 07.64†	4107.599	07.64	3	2	"	"	338.1
* 05.32†		05.38	6	8 <sup>bv</sup>	"	"	351.6
* 04.92†		04.92	4	6	"	"	354.2
* 04.55	04.516	04.59	4	6	"	"	356.4
		* 03.57		2	"	"	362.2
* 02.31†	02.285	02.31	6	10	"	"	369.9
		01.15		4	"	"	376.6
* 4099.93†	4099.921	00.00	7	16	"	6.9	383.7
		* 4099.03		2	"	"	389.1
* 98.54†	98.510	98.55	4	4	"	"	392.1
* 97.09†		97.08	3	2	"	"	400.7
* 95.64†	95.607	95.66	6	12	"	"	409.4
* 94.42		94.41	4	4	"	"	416.6
* 93.65		93.66	4	4	1.12	"	421.1
* 92.83†		92.86	6	8 <sub>n</sub>	"	"	426.0
* 92.54†	92.532	92.53	4	4	"	"	427.9
* 92.09		92.10	3	4	"	"	430.4
* 90.70†	90.703	90.79	6	16	"	"	438.6
		85.81		4	"	"	468.0
		* 84.90		2	"	"	473.5
		* 83.07		6	"	"	484.5
		80.6		26	"	"	487.3
	77.849 Sr	77.86		2	"	"	515.8
* 72.30		72.32	4	2	"	"	549.2
* 71.67†	71.664	71.65	5	4	"	"	553.1
		* 70.92		2	"	"	557.6
		* 68.13		4	"	"	574.4
* 67.90		67.87	3	4	"	"	575.9
		67.13		2	"	"	580.4
		* 65.21		12	"	"	592.0
* 64.09	64.061	64.12	5	6	"	"	598.9
		* 62.86		2	"	"	606.3
		* 61.75		2	"	"	613.0
* 60.97		61.00	2	2	"	"	617.7
		58.95		2	"	"	630.0
* 57.21	57.206	57.22	6	8	"	"	640.5
		56.41		4	"	"	645.4
		* 53.76		8	1.11	"	661.6
		* 53.40		2	"	"	663.7
* 52.60		52.60	2	2	"	"	668.6
* 51.48†	51.485	51.52	5	10	"	"	675.4
* 51.11		51.13	5	10	"	"	677.6
		49.20		4	"	"	689.3
* 48.77		48.78	4	4	"	"	692.9
		47.60		2	"	"	699.1
* 47.05		47.08	2	2	"	"	702.4
		46.50		6	"	"	705.8
* 42.78	42.759	42.81	4	4	"	"	729.6
* 41.72			4		"	"	735.0

\* Lockyer and Baxandall, 4108.32, 07.60, 05.33, 04.93, 04.52, 03.54, 02.25, 4099.94, 98.99, 98.50, 97.05, 95.60, 94.38, 93.61, 92.81, 92.55, 92.08, 90.74, 84.92, 83.07, 72.28, 71.67, 70.94, 68.16, 67.96, 65.54, 64.11, 62.92, 61.76, 61.00, 57.21, 53.81, 53.41, 52.60, 51.52, 51.10, 48.77, 46.99, 42.80, 41.66.

VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
* 4040·46		4040·50	2	2	1·11	6·9	24742·7
		* 39·76		4	"	7·0	746·9
		38·72		2	"	"	753·3
* 36·93†		36·95	2	8	"	"	764·2
* 35·77†		35·82	4	16	"	"	770·3
		34·91		2	"	"	776·7
* 33·01		33·04	2	2	"	"	788·2
* 32·62†		32·67	3	2	"	"	790·6
* 31·98	4031·961	32·05	4	6	"	"	794·6
* 31·37†		31·43	3	4	"	"	798·3
		30·32		2	"	"	804·9
* 30·04†		30·07	3	2	"	"	806·5
		29·2		2n	"	"	811·8
		28·27		2	"	"	817·5
		27·52		2n	"	"	822·2
		26·65		2	"	"	827·5
* 25·46		25·50	2	2	"	"	834·8
		* 24·60		2	"	"	840·2
* 23·50†	23·51	23·53	4	20	"	"	846·9
	* 22·038	22·05	2	2	"	"	856·0
		21·61		2	"	"	858·7
		* 20·70		2	"	"	864·3
		* 19·6		2b	"	"	871·1
		* 19·20		6	"	"	873·6
		17·44		6	"	"	884·5
		* 16·98		6	"	"	887·3
		15·81		2	1·10	"	894·6
		15·51		2	"	"	896·4
* 15·20		15·23	2	2	"	"	898·2
		14·46		2	"	"	903·0
		* 13·68		2n	"	"	907·8
		13·55		2n	"	"	908·6
		12·70		2n	"	"	913·9
		11·74		2n	"	"	919·8
* 11·45		11·47	2	2	"	"	921·5
* 09·94		09·95	2	2n	"	"	931·0
		* 08·36		6	"	"	940·9
* 05·86†	05·838	05·90	4	16	"	"	956·4
* 03·70		03·66	3	2	"	7·1	969·9
* 03·10†		03·12	3	10	"	"	973·5
		01·83		2	"	"	981·5
		01·29		2	"	"	984·8
* 00·24		00·25	2	2	"	"	991·4
		3999·40		6	"	"	996·7
* 3998·87	3998·847	98·90	6	8	"	"	25000·0
* 97·30†		97·28	3	10	"	"	009·8
* 92·95†	92·916	92·96	6	12	"	"	037·1
		92·14		2	"	"	042·1
		91·65		2	"	"	045·2
		* 91·30		2n	"	"	047·4

\* Lockyer and Baxandall, 4040·43, 4039·76, 36·93, 35·77, 33·00, 32·64, 31·99, 31·36, 30·05, 25·47, 24·63, 23·48, 22·07, 20·73, 19·58, 19·18, 16·86, 15·26, 13·69, 11·50, 09·99, 08·33, 05·90, 03·70, 03·12, 03·24, 3998·91, 97·31, 92·95, 91·22, and also 4106·08, 01·65, 10·99, 4090·05, 88·00, 83·44, 78·10.



VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo	
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$		
* 3990·71†	3990·693	3990·72	6	12	1·10	7·1	25051·1	
* 88·97		* 89·93		6	"	"	056·0	
		88·96	4	6	"	"	062·1	
		* 88·22		2	"	"	066·7	
		87·82		2	"	"	069·2	
* 84·75†		85·40		8	"	"	084·5	
		84·73	4	6	"	"	087·6	
		* 84·45		6	"	"	090·5	
		84·08		2	"	"	092·8	
* 80·66		* 81·92		2	"	"	106·4	
	80·69	4	6b <sup>r</sup>	"	"	114·3		
	* 79·59	79·56	4	6	"	"	121·3	
	* 79·30	79·23	4	6	"	"	123·0	
* 73·79	79·540	* 77·88		10	"	"	131·9	
		* 75·47		2	1·09	"	147·2	
		73·80	4	16	"	"	157·7	
		—	2		"	"	159·7	
		72·08	2	2n	"	"	168·5	
		70·27	4	2	"	"	180·1	
		* 68·24	68·60 Ca?	2	2	"	"	190·8
			68·19	4		"	"	193·1
			* 64·65	4	2n	"	"	215·8
		* 63·77†	61·652 Al	63·77		6	"	"
61·65 Al?	10	4		"	7·2	234·8		
60·49		2n		"	"	242·4		
58·33				"	"	256·0		
* 52·09†	52·073	52·11	4s	18	"	"	295·8	
* 50·37		50·37	4	4	"	"	306·9	
		* 48·74		4	"	"	317·3	
		47·93		2	"	"	322·5	
		* 46·04		2	"	"	334·7	
		44·68		2	"	"	343·4	
		44·20 Al?	6	2	"	"	346·7	
* 43·77		43·79	5	6	"	"	349·2	
* 42·16		42·16	4	4	"	"	359·6	
* 41·40†		41·43	3	4	"	"	364·4	
* 40·75	33·775 Ca	40·74	2	2	"	"	368·7	
* 39·48		39·48	4	4	"	"	376·9	
		* 39·00		2	"	"	380·0	
* 38·35		38·34	4	4	"	"	384·2	
* 37·68		37·69	4	4	"	"	388·4	
		36·61		2n	1·08	"	395·4	
* 36·42		36·43	4	4	"	"	396·6	
* 35·28		35·30	5	6	"	"	403·9	
* 34·16		34·20	7	6	"	"	411·1	
		33·81 Ca?	6	6	"	"	413·6	
* 31·50		31·49	4	8	"	"	428·4	
* 30·19		30·21	2	4	"	"	436·8	
		* 29·89		6	"	"	438·8	
		28·73		2	"	"	446·3	

\* Lockyer and Baxandall, 3990·72, 89·95, 88·98, 88·21, 84·78, 84·51, 81·78, 80·66, 79·61, 79·31, 77·88, 75·48, 73·79, 73·53, 72·12, 68·29, 64·64, 63·78, 52·12, 50·38, 48·79, 46·04, 43·81, 42·18, 41·40, 40·75, 39·49, 39·04, 38·37, 37·65, 36·43, 35·28, 34·18, 31·46, 30·19, 29·93, 28·64, and also 3990·05, 88·00, 83·44, 78·10, 23·28, 3995·08.



## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda}$	
		*3926.68		4n	1.08	7.2	25459.6
		26.45		4	"	"	461.1
*3925.36	3925.350	25.40	4	6	"	"	468.2
* 24.84	24.768	24.86	5	8	"	"	470.7
* 22.58†	22.548	22.61	5	8	"	"	486.2
* 22.05	22.023	22.08	4	6	"	"	489.7
* 20.65		20.68	3	4	"	"	498.7
* 20.15		20.16	2	2	"	"	502.0
	19.600	—	2		"	"	505.6
* 16.55†		16.59	3	14	"	"	525.3
		*15.55		2	"	"	532.0
		*15.28		2	"	"	533.8
	*14.437	14.51	2	14	"	"	539.0
		*13.67		2n	"	"	544.3
* 13.03		13.07	4	4	"	"	548.3
* 12.36		12.37	5s	6	"	"	552.8
* 10.95		10.95	4s	4	"	"	562.0
* 10.01†	09.995	10.05	6	6	"	"	568.0
		09.85		4	"	"	569.2
		*08.5		2b <sup>v</sup>	"	7.3	578
		*07.35		2n	"	"	585.5
* 06.89†		06.93	4s	4	"	"	588.4
* 04.63		04.65	2	4	"	"	603.3
		04.27		2	"	"	605.7
* 03.42†		03.50	3	8n	"	"	611.0
* 02.71		02.70	2	4n	"	"	616.0
* 02.40†	02.371	02.41	7	6n	"	"	618.0
		* 01.86		2	"	"	621.5
* 01.30		01.30	5n	4n	"	"	625.2
		00.72	5n	2	"	"	629.0
* 00.33		00.32	2	4	"	"	631.6
*3899.30†		3899.32	2	8	"	"	638.6
* 98.15†	3898.082	98.2	6	6b	"	"	645.9
* 97.22		97.22	4	4	"	"	652.0
		*96.80		2	1.07	"	654.8
* 96.29	96.259	96.32	4s	6	"	"	658.1
* 94.19†		94.18	4s	4n	"	"	672.0
* 93.03		93.03	6s	6	"	"	679.6
	* 92.471	92.63		2n	"	"	682.8
* 91.27		91.4	4b	4b	"	"	690.8
* 90.33†	90.298	90.35	6s	6	"	"	697.4
		*89.37		2	"	"	703.8
* 88.50		—	4n		"	"	709.6
* 88.23		88.20	2	2	"	"	711.4
* 86.72	86.691	86.73	4s	4	"	"	721.4
* 85.91†		85.95	2	2	"	"	726.6
		85.83		2	"	"	727.2
85.00 †		85.03	2	6	"	"	732.6
84.60		84.60	3	2	"	"	735.4

\* Lockyer and Baxandall, 3925.36, 24.85, 22.57, 22.11, 20.67, 20.10, 16.57, 15.57, 15.30, 14.49, 13.71, 13.04, 12.35, 10.92, 09.96, 08.46, 07.33, 06.92, 04.51, 03.32, 02.45, 01.81, 01.28, 00.29, 3899.23, 98.17, 97.20, 96.83, 96.29, 94.16, 92.95, 92.53, 91.25, 90.30, 89.36, 88.47, 88.20, and also 3945.36, 28.07, 26.86, 26.64, 14.08, 11.90, 10.57, 09.58, 03.86, 3898.44, 95.86, 93.88, 91.88, 89.91, 87.69.

VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda}$	
3884.04		3884.05	3	2	1.07	7.3	25739.0
		83.53		2	"	"	742.5
		83.37		2	"	"	743.5
		81.78		2	"	"	754.1
		81.20		2	"	"	757.9
		80.47		2	"	"	762.8
79.82		79.79	3	2	"	"	767.2
		78.85		1b	"	"	773.5
		76.90		2n	"	"	786.5
76.21†		76.25	5	4	"	"	791.0
76.05†		76.03	4	4	"	"	792.2
		75.78		2	"	"	794.0
		75.52		2	"	"	795.7
75.22†	3875.195	75.21	6	6	"	"	797.8
		74.50		2	"	"	802.5
73.80		73.79	2	4	"	"	807.2
		73.38		2	"	"	809.5
		72.90		2	"	"	813.1
71.23		71.21	4	6	"	"	824.3
70.72		70.73	2	4	"	"	827.7
		70.14		2	"	"	831.5
		68.20		2n	"	"	844.5
67.77†		67.75	5	6	"	"	847.4
67.50		67.49	2	2	"	"	849.2
		66.90		6	"	"	853.2
		66.52		2	"	"	855.7
		65.9		4b	"	"	860
65.02†	64.980	65.02	7	8	"	"	865.8
64.02		64.00	4s	8	"	"	872.6
62.37		62.35	4s	4	"	"	883.6
		60.88		2n	"	"	893.5
59.51		59.49	3	4	"	"	902.8
58.83†		58.81	3	4	"	"	907.4
		58.0		2n	"	"	913
		57.31		2n	"	"	917.5
56.00†	55.965	56.00	8	6n	1.06	"	926.4
55.50†	55.486	55.49	6	6	"	"	929.7
		53.60		2	"	"	942.5
52.27		52.21	2	4	"	"	951.6
51.32		51.30	3	4	"	"	957.9
		50.57		2	"	"	962.9
		50.30		2n	"	"	964.7
49.48	49.433	49.44	4	6	"	"	970.4
47.46	47.453	47.50	5s	10	"	"	983.8
45.03		45.03	2	2	"	"	26000.3
44.58†	44.565	44.60	5s	8	"	"	003.3
		43.65		4	"	"	009.6
		42.88		4	"	"	014.9
42.03		—	4	4	"	"	020.6
40.88†	40.866	40.92	6	8	"	"	028.3
40.56		40.56	5	6	"	"	030.6
40.27		40.26	4	4	"	"	032.5
39.53		39.53	4	6	"	"	037.6
39.12†		39.13	4	6	"	"	040.3
		37.90		2n	"	"	048.2

## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda}$	
		3836.58		2n	1.06	7.3	26057.6
3836.20		36.19	4	4	"	"	060.2
35.70		35.69	4	4	"	"	063.6
		34.97		2	"	"	068.5
33.36†		33.38	2	2	"	"	079.4
32.97		33.00	2	2	"	"	081.9
		32.50		2	"	"	085.3
		31.98		2	"	"	088.9
		31.19		2	"	"	094.2
		30.42		2n	"	"	099.5
		29.77		4n	"	"	103.9
		28.9		6n	"	"	110
28.67†	3828.680	28.72	7	6n	"	"	111.3
		27.13		6	"	"	121.9
		26.95		2n	"	"	123.2
		25.47		2	"	"	133.3
		25.17		2	"	"	135.3
24.12		24.14	4	4	"	"	142.4
		23.90		2	"	"	144.0
		23.5		4b	"	"	147
23.35 †		23.37	4	4	"	"	147.7
23.00 †	23.008	23.05	4	4	"	"	149.9
		22.86		2	"	"	151.1
22.14†		22.21	5	6b <sup>v</sup>	"	"	155.8
21.63†	21.607	21.66	4	4	"	"	159.6
	20.589	—	4		"	"	166.7
20.41		—	2		"	"	167.9
20.10	20.087	20.14	4	4	"	"	170.0
		18.94		2	"	"	178.0
		18.48		4	"	"	181.1
18.37†	18.370	18.39	6	4	"	"	181.8
18.12		18.10	3	4	"	7.4	183.6
17.98†		17.99	4	4	"	"	184.4
15.65		15.55	4	10	1.05	"	200.8
13.63	13.612	13.63	6	8	"	"	214.4
		09.80		6	"	"	240.7
08.64†		08.70	5s	6	"	"	248.5
	08.136	—	8		"	"	252.1
07.64	07.626	07.69	4	6	"	"	257.5
	07.425	—	4		"	"	257.1
06.93		07.00	4	4	"	"	253.3
		06.65		2	"	"	262.4
		06.37		2	"	"	264.3
		05.12		2	"	"	273.0
		04.80		2	"	"	275.2
		04.6		2n	"	"	277
04.05		04.07	3	4	"	"	280.3
03.92		03.97	3	4	"	"	281.1
03.62†	03.613	03.64	5	6	"	"	283.3
		03.06		2	"	"	287.2
		01.4		2n	"	"	299
00.05	3799.992	00.07	5	8	"	"	308.1
		3799.43		2	"	"	312.3
		98.82		4	"	"	316.6
		98.41		2	"	"	319.4

## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		3796.66		4	1.05	7.4	26331.5
		96.37		2	"	"	333.5
3795.12		95.08	7	10	"	"	342.3
		94.49		8	"	"	346.6
93.76†		93.76	4	4	"	"	351.7
		93.53		2	"	"	353.3
		91.47		2	"	"	367.6
90.62††	3790.593	90.64	3	6	"	"	373.5
90.46	90.448	90.48	5	6	"	"	374.6
		88.92		2	"	"	385.5
87.68		87.39	2	16	"	"	395.0
		84.98		2	"	"	412.8
84.84		84.88	2	2	"	"	413.7
		83.6		2b	"	"	422.5
		83.08		2n	"	"	426.1
82.70		82.70	2	2	"	"	428.8
		82.27		2n	"	"	431.8
		81.90		2	"	"	434.3
81.54		81.55	3	4	"	"	436.8
		80.85		2	"	"	441.7
79.80		79.86	3	6	"	"	448.8
78.83†	78.808	78.82	5s	10	"	"	455.9
78.48†		78.50	2	12	"	"	458.2
77.63†		77.63	2	4	"	"	464.2
77.31		77.30	2	4	"	"	466.5
		77.00		2	"	"	468.6
76.31		76.29	3	4	1.04	"	473.5
75.85		75.80	3	4	"	"	476.9
75.34†		75.32	3	4	"	"	480.3
		74.82		6	"	"	483.9
74.27		74.29	2	4n	"	"	487.7
		73.92		2	"	"	490.3
		73.14		10	"	"	495.7
		72.30		2n	"	7.5	501.5
71.87			3n		"	"	504.5
71.31†			2		"	"	508.5
71.11†		71.13	4	20	"	"	509.8
70.68		70.67	2	2	"	"	512.9
		70.10		2n	"	"	517.0
		69.97		2n	"	"	517.9
69.23		69.18	2	6	"	"	523.3
		67.84		8	"	"	532.9
		66.53		2	"	"	542.1
64.96		64.94	2	4	"	"	553.3
63.30		63.26	4	4	"	"	565.5
		61.55		4	"	"	577.3
		61.43		4	"	"	578.1
60.96		60.95	2	4	"	"	581.5
60.40†		60.40	2	10	"	"	585.4
		59.41		6	"	"	592.4
		58.90		2	"	"	596.0
		57.82		2	"	"	603.7
		57.51		2	"	"	605.9

† Ru 3790.65, Cr 3790.61.



VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
3756.18		3756.15	2	2	1.04	7.5	26615.4
55.85		55.77	2	4n	"	"	617.9
		55.23		2n	"	"	622.0
		54.65		2n	"	"	626.1
53.44		53.38	2	4n	"	"	634.9
		53.00		2	"	"	637.8
51.94†		51.94	2	2	"	"	647.4
51.02†			4s		"	"	651.9
		50.43		8n	"	"	656.1
		50.10		12n	"	"	658.4
48.14		48.10	2	2	"	"	672.5
		47.28		2	"	"	678.5
46.02		46.00	4s	14	"	"	687.5
		43.77		8b <sup>v</sup>	"	"	703.6
41.65†	3741.630	41.63	3	6n	"	"	718.8
		41.20		2	"	"	721.9
40.38†	40.374	40.39	3	4	"	"	726.7
38.93	38.901	38.92	4	4n	"	"	738.2
38.15	38.129	38.15	3	4	"	"	743.7
		37.60		2	1.03	"	747.6
		36.16		10	"	"	757.9
34.59		34.62	3	4n	"	"	769.1
		33.75		4n	"	"	775.2
32.88†		32.98	4s	14	"	"	781.1
		32.15		8	"	"	786.6
		31.20		2n	"	"	793.4
		30.36		2	"	"	799.5
		29.99		2	"	"	802.2
29.22		29.21	3	6	"	"	807.7
		28.51		10	"	7.6	812.9
27.49†		27.53	4	16b <sup>r</sup>	"	"	820.0
		25.83		2	"	"	832.1
		25.1		2n	"	"	837
		24.6		2n	"	"	839
		23.75		2	"	"	847.1
23.52		23.49	3	2	"	"	848.8
22.76			4		"	"	855.2
22.27†	22.334	22.39	2	6n	"	"	857.3
22.15	22.136	22.18	2	4n	"	"	858.5
		21.55		2n	"	"	862.9
		21.1		2n	"	"	866
	19.124 }						
	19.051 }	19.07		6	"	"	880.9
		18.35		10	"	"	886.0
15.62†		15.70	4s	20	"	"	905.2
14.12		14.12	2	4	"	"	916.7
		13.72		2	"	"	919.6
		12.69		4	"	"	927.0
		11.90		4	"	"	932.8
		11.28		8	"	"	937.3
08.88	08.852	08.86	3s	6	"	"	954.9
	06.167	06.20		6	"	"	974.3
05.19†	05.167	05.22	5	6	"	"	981.5

† Ni 3715.61.

## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda}$	
3704·85†	3704·831	3704·90	6	6b <sup>v</sup>	1·03	7·6	26984·0
	04·664		2		"	"	985·4
03·71†		03·80	7	12b <sup>r</sup>	"	"	992·0
		01·13		6	"	"	27011·1
		00·50		12	"	"	015·8
		00·35		6n	"	"	017·0
		3699·63		2	"	"	022·1
3696·00†	3695·995	96·02	6	8	1·02	"	048·7
95·48†	95·449	95·50	5	6n	"	"	052·5
		94·74		2n	"	"	057·9
92·36†	92·357	92·38	6	10	"	"	075·3
90·41†	90·407	90·43	5	8	"	"	090·3
88·22†	88·207	88·21	5	8	"	"	105·8
87·61†		87·60	5	6n	"	"	110·3
		86·83		2	"	"	116·0
86·40†	86·392	84·40	4	6	"	"	119·2
		85·31		6	"	"	127·2
84·83			3		"	7·7	130·7
		84·47		2	"	"	133·2
83·26	83·243	83·25	6	6	"	"	142·2
		81·5		2b	"	"	155
80·26	80·214	80·15	6	8n	"	"	164·7
	80·055		2		"	"	165·8
		77·47		2n	"	"	184·9
		77·17		2n	"	"	187·1
76·86‡	76·807	76·80	6n	6n	"	"	189·7
75·85†	75·835	75·83	5s	6	"	"	197·0
		75·58		2	"	"	198·9
		74·83		6	"	"	204·4
73·55†		73·50	6n	6n	"	"	214·3
72·53‡	72·519	72·51	4n	4n	"	"	221·6
	71·840		2		"	"	226·6
71·37†		71·33	4	6	"	"	230·2
69·57†		69·53	3	16	"	"	243·6
67·87	67·841	67·84	5n	6n	"	"	256·2
		65·9		2n	"	"	271
65·30	65·256	65·22	4	4n	"	"	275·5
63·73	63·694	63·68	5	6n	"	"	287·1
		61·53		12	"	"	303·3
		58·38		4	"	"	326·8
		57·92		2	1·01	"	330·2
		57·60		2	"	"	332·6
		56·80		4b	"	"	338·6
		54·8		2b	"	"	354
		53·61		2	"	"	362·5
		52·51		2n	"	"	370·7
49·13†	49·057	49·10	4	4	"	"	396·3
		47·45		2n	"	"	408·7
		46·98		4	"	"	412·3
		46·02		6	"	"	419·4
45·77		45·7	3	2b	"	"	421
44·88†		44·83	3	4	"	"	428·2
44·05	44·038	43·99	3	4	"	"	434·7

‡ Ru 3676·82, 72·53.

VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		3643.27		2	1.01	7.7	27440.1
		42.82		2	"	"	443.5
3641.28		41.25	3	2b	"	"	455.2
40.25		40.20		2n	"	"	462.6
39.21†	3639.160	39.14	3	4	"	7.8	471.0
38.57			2		"	"	475.5
37.95†		37.89	2	4	"	"	480.4
36.09		36.03	4	2n	"	"	494.5
		35.57		2	"	"	498.2
		34.06		2	"	"	509.6
		33.02		2	"	"	517.5
		29.45		2n	"	"	544.6
		27.83		8	"	"	556.9
		25.71		8	"	"	573.0
		24.98		2	"	"	578.6
22.82†		22.82	2	2n	"	"	595.0
		22.43		2	"	"	598.1
		21.35		8	"	"	606.2
		20.62		6	"	"	611.8
19.10		19.09	2s	12	"	"	623.4
		18.6		2	"	"	627
16.91		16.83	2	4	1.00	"	640.4
		15.4		2b	"	"	652
		12.4		2b	"	"	675
		11.71		4	"	"	679.9
09.45†		09.40	3s	2	"	"	697.4
		08.07		2	"	"	707.8
05.75		05.73	3	4	"	"	725.8
		05.46		2	"	"	727.9
		05.0		2n	"	"	731
		04.25		2n	"	"	737.2
		03.10		2	"	"	746.0
00.20	00.166	00.16	2	2	"	"	768.6
		3597.1		2n''	"	7.9	792
		95.77		2	"	"	802.6
3593.48†	3593.519	93.53	4	16	"	"	820.0
92.71		92.70	2	2	"	"	826.2
92.15†	92.159	92.19	4	18	"	"	830.5
89.91†	89.889	89.90	4	18	"	"	848.0
		88.25		6	"	"	860.8
		84.56		2	"	"	889.5
83.84†	83.840	83.85	2	2	"	"	895.1
83.00	82.953	82.97	2	2	"	"	901.9
81.00		80.94	2	2	"	"	917.7
		79.49		2	"	"	929.0
		78.78		4	"	"	934.6
78.01†	78.007	78.00	2	4	"	"	940.6
		77.80		2n	0.99	"	942.2
		77.35		4	"	"	945.7
75.26†		75.25	2	2	"	"	959.1
74.92†	74.915	74.94	2	2	"	"	964.7
		74.51		8	"	"	968.0
73.69	73.652		2		"	"	974.3
		73.21		8	"	"	977.8
		72.82		2n	"	"	981.2

## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		3572.50	0	2	0.99	7.9	27983.8
3571.82†		71.81	3	4	"	"	989.1
		71.38		2	"	"	992.4
71.18		71.18	3	2	"	"	994.0
		69.46		2	"	"	28007.5
69.11†		69.09	3	2	"	"	010.3
		68.45		2	"	"	015.4
66.33†		66.32	3	12	"	"	032.1
		63.90		2b	"	"	051.2
63.59		63.53	2	2n	"	"	053.9
62.31		62.31	2	2	"	"	063.7
		61.54		2	"	"	069.8
60.75†		60.78	2	8	"	"	075.9
		59.43		2	"	"	086.4
56.97		56.93	5s	20	"	"	106.1
56.42		56.40	3	4n	"	"	110.3
		55.90		2	"	"	114.4
55.32		55.30	3	2	"	"	119.0
53.43	3553.412	53.44	6	4	"	"	134.0
	51.669	51.69	2	2	"	8.0	147.7
		49.10		2n	"	"	168.1
		48.82		2n	"	"	170.4
		47.22		2	"	"	183.0
		46.96		2	"	"	185.1
45.52	45.419		3		"	"	197.0
45.34†	45.330	45.36	4	20r	"	"	198.0
43.68	43.631	43.63	3	4	"	"	211.5
		42.63		2n	"	"	219.6
		41.50		10	"	"	228.6
		40.66		2	"	"	235.3
		38.88		8	"	"	249.5
		35.54		2	0.98	"	276.2
		34.83		2	"	"	281.9
33.85†	33.820	33.86	6	8	"	"	296.2
		32.45		6	"	"	300.9
		31.63		4	"	"	307.5
30.91†		30.96	4	20	"	"	313.3
		30.6		2n	"	"	316
29.90†	29.876	29.89	4	6	"	"	321.5
		28.4		2b	"	"	333
		28.00		6	"	"	336.7
		27.4		2b	"	"	341
		25.96		2	"	"	353.1
24.89		24.89	3	16	"	"	361.7
24.38†			4		"	"	365.8
		23.8		2b	"	"	370
		23.35		2n	"	"	374.0
		22.75		2	"	"	378.9
		22.02		12	"	"	384.7
		20.72		6b <sup>v</sup>	"	"	395.3
20.18†		20.19	4	14	"	"	399.5
		19.33		2	"	"	406.4
17.44†	17.436	17.46	4	20r	"	"	421.7
		16.16		2	"	"	432.0
		14.60		6	"	"	444.7



VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		3514.02		6	0.98	8.0	28449.4
		12.33		2	"	"	463.0
		11.57		2	"	"	469.2
		11.02		2	"	"	473.7
		09.18		6	"	8.1	496.7
		07.69		6	"	"	500.6
		07.00		2	"	"	506.3
		06.70		4	"	"	508.7
3505.83†		05.84	2	4	"	"	515.8
04.57†		04.58	3	16	"	"	526.0
		03.35		2	"	"	535.9
01.65	3501.614	01.65	2	2	"	"	550.9
		01.03		2	"	"	554.8
		00.50		2	"	"	559.2
		00.00		4	"	"	563.3
3498.23		3498.34	2	2	0.97	"	577.2
97.13	3497.081	97.23	2	14	"	"	586.5
93.34		93.27	2	12	"	"	618.1
		90.11		4	"	"	644.3
89.64	89.648	89.59	2n	2	"	"	648.1
		87.13		2	"	"	670.8
86.05†		86.09	2	12	"	"	677.5
		84.82		2	"	"	687.8
		84.48		2	"	"	690.5
		80.01		8	"	"	727.4
		79.10		2	"	"	735.0
		77.67		6	"	"	746.0
		77.5		4b	"	"	748
		76.38		4	"	"	757.4
		70.44		4	"	8.2	806.6
		69.69		6	"	"	812.8
		66.75		4	"	"	837.3
		65.39		2	"	"	848.6
		64.34		2	"	"	857.3
		64.00		2	"	"	860.2
		63.50		2	"	"	864.3
		63.22		2	"	"	866.6
		61.71		2	"	"	879.2
	57.048	57.30	2n	14	0.96	"	916.1
		55.02		2	"	"	918.1
		53.23		8	"	"	935.1
		51.20		2	"	"	950.2
		47.7		2b	"	"	967.2
		45.95		2	"	"	997
		44.46		2n	"	"	29011.4
		42.48		2	"	"	023.9
		42.17		2	"	"	040.6
		37.90		2b	"	"	043.2
		36.52		2n	"	"	059.3
		35.52		2n	"	"	091.0
		34.15		2n	"	"	099.4
		33.96		2n	"	"	111.0
		32.1		2b	"	8.3	112.7
		30.30		2n	"	"	128
							143.7

## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		3425·35		2n	0·96	8·3	29184·8
	3425·204	25·22	2n	4	"	"	186·9
		24·00		2	"	"	197·3
		22·40		2	"	"	210·9
		20·86		2	"	"	223·8
		20·35		2n	"	"	228·4
	18·676		2n		"	"	242·7
		17·22		2	0·95	"	255·2
		15·00		2n	"	"	274·3
	14·370	14·35	2n	4	"	"	279·8
		09·10		4b <sup>v</sup>	"	"	324·9
		08·15		2	"	"	333·2
	06·989	07·00	2n	2	"	"	343·0
		06·36		2	"	"	348·5
		06·19		2	"	"	350·0
	06·012		2n		"	"	351·5
		05·31		2	"	"	357·6
		05·12		2	"	"	359·2
		04·60		8	"	"	363·7
		03·50		2	"	"	373·2
		03·32		2	"	"	374·7
		02·73		2	"	"	379·9
		02·15		2n	"	"	384·9
		01·50		2	"	"	390·5
		00·54		4	"	"	398·8
		3398·40		2	"	"	417·3
		97·97		2	"	"	421·0
		97·69		2	"	"	424·2
		36·68		2	"	"	432·2
		95·7		2n	"	8·4	441
		94·73		2	"	"	449·0
		92·81		6	"	"	465·7
		90·90		2	"	"	482·3
		89·0		2b	"	"	499
		87·95		2	"	"	508·0
		87·52		2	"	"	511·7
		85·9		2b	"	"	525·8
		84·73		2	"	"	536
		83·87		4	"	"	543·6
		82·67		4	"	"	554·0
		80·42		2	"	"	573·7
		79·5		2n	"	"	582
		77·74		4	0·94	"	597·2
		77·49		2	"	"	599·4
		76·16		2	"	"	611·0
		74·13		2	"	"	628·8
		72·91		6	"	"	639·6
		71·60		2	"	"	651·4
		71·25		2	"	"	654·2
		70·60		2	"	"	659·9
		67·80		2	"	"	684·6
		66·98		2	"	"	691·8
	3365·670	65·68	6	2	"	"	703·3
		63·70		2	"	"	720·8
		61·67		6	"	"	738·7

VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda}$	
	3356·471	3361·37		6	0·94	8·5	29741·4
		56·51	4	2	"	"	784·5
		55·51		2	"	"	793·2
		54·85		2	"	"	799·1
		53·92		6	"	"	807·4
		49·56		6	"	"	846·2
		49·19		4	"	"	849·5
		48·57		2	"	"	855·0
		46·08		6	"	"	877·2
		42·04		4	"	"	913·3
		41·4		2n	"	"	919
		40·53		2	"	"	926·9
		38·00		12	0·93	"	949·6
		35·65		2	"	"	970·7
		35·37		2	"	"	973·1
		33·88		2	"	"	986·6
	33·693		2		"	"	988·3
		32·30		2	"	"	30000·8
	29·983	30·02	6	4	"	"	021·5
		29·63		2	"	"	024·9
		29·10		2n	"	"	029·6
		28·60		2n	"	"	034·2
		28·13		2	"	8·6	038·4
	24·514	24·57	2	2	"	"	070·9
		23·88		2	"	"	076·7
		23·12		2	"	"	083·6
	22·084		2		"	"	093·0
		21·72		10	"	"	096·3
		20·95		2	"	"	103·3
		20·33		2	"	"	110·9
		19·05		4	"	"	120·5
		18·04		4	"	"	129·7
		17·02		4	"	"	138·9
		15·65		2	"	"	151·4
		15·35		6	"	"	154·1
	14·980	15·00	2	6	"	"	157·4
	14·143		2		"	"	165·1
	13·141		2		"	"	174·3
	09·305	09·32	4	2	"	"	209·2
		08·62		4	"	"	215·5
		04·62		6	"	"	252·1
		01·82		2	"	"	277·8
		01·05		2	"	"	284·8
	3299·223		4		"	"	301·5
		3298·89		8	"	"	304·6
	98·276	98·26		2	"	"	310·3
		97·66			"	"	315·9
		96·19			"	"	329·5
		93·30		6	0·92	"	356·1
	91·805	91·80	6	2	"	"	369·9
		91·18		2	"	"	375·6
	90·362	90·40	4	6	"	"	383·0
	89·515	89·52	4	8b <sup>v</sup>	"	"	391·0
		89·11		4	"	"	394·7
	88·437	88·47	2	6	"	8·7	400·7

VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		3287.78		2	0.92	8.7	30407.0
		87.3		2b	"	"	411
		85.80		2	"	"	425
	3285.133	85.29	2	6	"	"	430.7
	84.489	84.50	2	2	"	"	437.3
		83.46		2	"	"	446.9
	82.659	82.69	2	10	"	"	454.2
		81.92		4	"	"	461.3
	81.238	81.26	2	6	"	"	467.4
	79.976	80.02	2	16	"	"	479.1
	78.053		2n		"	"	497.1
	77.881	77.88	2n	6	"	"	497.8
		77.55		6	"	"	501.9
		77.21		4	"	"	505.0
	76.252	76.25	16	20r	"	"	513.9
		74.65		4	"	"	528.9
		74.35		2	"	"	531.6
	73.137	73.17	2	2	"	"	542.8
	71.759		4		"	"	555.9
	71.243	71.27	16	20r	"	"	560.6
		70.25		10	"	"	569.9
		69.07		2	"	"	581.9
	67.823	67.84	16	20r	"	"	592.6
	66.027	66.06	2	10	"	"	609.3
		64.5		2b	"	"	624
		63.45		8	"	"	633.7
	62.422	62.45	2	2	"	"	643.2
		61.90		2	"	"	648.3
		61.73		2	"	"	649.9
	61.198	61.20	2	2	"	"	654.9
		59.80		2	0.91	"	668.0
	59.658	59.63	2	2	"	"	669.5
		58.02		8	"	"	684.8
	56.892		2		"	"	695.4
	55.769	55.72	2	2	"	"	706.2
	54.836	54.90	4	10	"	"	714.5
		53.00		2	"	"	732.1
	51.886	52.01	2	10	"	"	732.6
	50.894	50.90	2	10	"	8.8	751.9
	49.690	49.71	2	8	"	"	763.3
		48.74		2	"	"	772.3
		48.00		2	"	"	779.4
		47.69		2	"	"	782.3
		47.5		2n	"	"	784
		42.14		2	"	"	835.0
		41.30		2	"	"	843.0
		40.90		2	"	"	846.8
		40.00		2	"	"	855.4
		39.17		2	"	"	863.3
	37.990	38.08	4	12	"	"	874.2
		36.72		2	"	"	886.7
		34.64		4	"	"	906.5
	33.878 {	33.98	} 2 {	8	"	"	912.9
		33.67		6	"	"	915.8
	33.300	33.36	4	2	"	"	918.9



VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda}$	
	3232.064	3232.10	2	6	0.91	8.8	30931.0
		31.09		2	"	"	940.5
	30.765	30.80	2	2	"	"	943.5
	29.724	29.75	2	2	"	"	953.5
		29.30		2n	"	"	957.7
		28.7		2b	"	"	963
		28.3		2b	"	"	965
	27.520	27.54	2	2	"	"	974.7
		27.05		6b <sup>r</sup>	"	"	979.3
	26.223	26.22	2	2	"	"	987.2
		24.20		2	"	"	31006.6
		22.97		2	"	"	018.4
		21.52		2	"	"	032.4
	18.985	18.98	2	2	0.90	"	056.9
	17.240	17.23	2	12	"	"	073.8
	15.487		2		"	"	090.7
		14.86		8	"	"	096.8
		14.10		2	"	"	104.1
	12.550	12.55	2	4	"	"	119.1
		11.70		2	"	"	127.3
	10.546		2		"	"	138.5
	10.253	10.21	2	2	"	"	141.6
	08.464	08.46	2	8b <sup>r</sup>	"	"	158.8
	07.521	07.52	8	2	"	"	167.9
		06.4		2b	"	"	179
	05.689	05.70	6	2	"	8.9	185.5
	05.378	05.45	2	2	"	"	188.0
		04.30		2	"	"	199.1
		02.80		2	"	"	213.8
	02.495	02.50	12	2	"	"	216.7
		01.8		4b	"	"	223.5
	3199.934	3199.95	2	2	"	"	241.7
	98.121	98.09	2	2	"	"	259.6
		97.65		2	"	"	264.1
		96.66		4	"	"	273.7
		95.7		2b	"	"	283
	94.030	94.06	2	2	"	"	299.4
		93.29		4	"	"	306.8
		92.78		4	"	"	311.8
	90.798	90.80	10	16r	"	"	331.2
		89.87		2	"	"	340.3
	88.624	88.60	2	10r	"	"	352.7
		88.18		4	"	"	356.9
	87.820	87.78	8	10r	"	"	361.0
		86.93		4	"	"	369.3
	85.507	85.46	20	4r	"	"	383.5
	84.097	84.04	20	4r	"	"	397.4
	83.525	83.48	18	4r	"	"	403.1
		82.71		8	"	"	410.9
		79.50		2	0.89	9.0	442.5
		77.75		2	"	"	459.8
		76.2		2b	"	"	475
		74.61		8	"	"	490.9
		74.17		6	"	"	495.3
		72.34		2	"	"	513.5

## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		3171.82		2	0.89	9.0	31518.6
		70.35		2	"	"	533.3
		68.62		2	"	"	550.5
	3168.244	68.24	2	6	"	"	554.4
		67.55		10	"	"	561.1
		66.48		2	"	"	571.8
		65.96		4	"	"	577.0
	64.945	64.91	2	4	"	"	587.5
		63.85		2	"	"	598.1
		63.13		6	"	"	605.2
		62.81		6	"	"	608.5
		62.46		2	"	"	612.0
		61.42		6	"	"	622.4
		60.87		4	"	"	628.9
		59.45		4	"	"	642.1
		58.01		4	"	"	656.5
		56.35		2	"	"	673.1
		55.51		6	"	"	681.7
		54.9		2n	"	"	688
		51.42		8	"	"	722.7
		48.86		4	"	"	748.5
		46.95		4	"	9.1	767.7
		46.40		6	"	"	773.2
	46.086	46.10	2	4	"	"	776.4
		45.48		4	"	"	782.5
		44.85		4	"	"	787.9
		43.61		4	"	"	801.5
	42.596	42.67	4	8b <sup>v</sup>	"	"	810.0
		42.33		4	"	"	813.4
		41.63		4	0.88	"	821.5
		41.23		2	"	"	825.6
	39.862	39.88	2	10	"	"	839.3
		38.17		4	"	"	856.6
	37.304		2		"	"	865.4
		36.64		12	"	"	872.1
	35.060	35.08	2	12	"	"	888.1
	33.455	33.48	10	10	"	"	904.4
		32.90		2	"	"	910.2
		32.72		2	"	"	912.0
	30.408	30.40	10	12	"	"	935.7
		28.81		4	"	"	951.9
		28.40		4	"	"	956.1
	26.338	26.31	10	8	"	"	977.3
		25.52		8	"	"	985.6
	25.402		10		"	"	986.8
		25.20		8n	"	"	988.8
		23.49		2	"	"	32006.3
	23.020	23.01	2	10	"	"	011.2
	21.261	21.27	2	8	"	"	029.2
	20.849		2		"	"	033.4
		20.36		8	"	"	038.5
		19.44		2	"	"	047.9
	18.406	18.51	16	12r	"	"	058.0
		16.90		6	"	"	074.1
		16.18		2	"	"	081.5

VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
	3113.038	3113.19	2	8	0.88	9.2	32113.0
	10.826	10.82	2	12r	"	"	136.7
		09.51		4	"	"	150.2
	09.381		2		"	"	151.5
	09.283		2		"	"	152.5
		08.81		4	"	"	157.4
		07.85		2n	"	"	167.4
		06.9		2n	"	"	177
		06.08		2n	"	"	185.7
		05.67		2n	"	"	189.9
		05.03		4	"	"	196.5
	02.415	02.39	20	12r	"	"	224.9
	01.038	01.09	2	10	0.87	"	237.6
	3094.793		2n		"	"	313.6
		3094.33		12	"	"	307.9
		93.23		16r	"	"	319.2
		89.78		2	"	"	355.6
		88.1		2b <sup>v</sup>	"	"	373
		86.61		4	"	"	388.8
		86.33		2	"	"	391.8
		83.31		6	"	"	423.5
		82.65		6	"	"	430.4
		82.20		2	"	"	435.1
		81.39		2	"	"	443.7
		81.13		4	"	"	446.4
		80.4		2n	"	"	454.0
		79.0		2n	"	"	469
		78.75		2n	"	"	471.5
		76.12		2	"	9.3	499.2
		75.7		2b	"	"	504
		75.3		2b	"	"	508
		74.77		2	"	"	513.5
		72.96		2	"	"	532.6
		70.31		2	"	"	560.0
		69.82		2	"	"	565.9
		67.20		10	"	"	593.7
		66.5		2b	"	"	601
		65.71		4	"	"	609.6
		63.80		10	"	"	629.9
		62.80		4	0.86	"	640.5
		62.31		2	"	"	645.8
		60.60		2n	"	"	664.0
		59.3		2b	"	"	678
		57.55		2	"	"	696.6
		56.46		2	"	"	708.3
		56.03		2	"	"	712.9
		54.00		8	"	9.4	734.5
		53.48		10	"	"	740.1
		52.3		2b	"	"	753
		51.44		2n	"	"	762.0
		50.85		6	"	"	768.4
		49.00		6	"	"	788.2
		48.76		10 <sup>r</sup>	"	"	790.8
		45.10		2	"	"	830.5
		43.62		4	"	"	846.2

VANADIUM—*continued*.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda}$	
		3043.27		2	0.86	9.4	32850.0
		42.39		8	"	"	859.9
		41.52		6	"	"	868.9
		39.9		2n	"	"	886
		38.63		4	"	"	900.1
		35.28		2	"	"	936.5
		34.55		2	"	"	944.4
		33.99		8r	"	"	950.5
		33.55		8r	"	"	955.3
		32.30		2	"	"	968.9
		31.15		2n	"	"	981.5
		29.65		2	"	"	997.7
		28.15		6	"	"	33014.1
		27.70		4	"	"	019.0
		25.08		6	"	"	037.6
		23.99		6	"	9.5	059.4
		22.70		6	0.85	"	073.5
		22.29		2	"	"	078.0
		20.4		2b	"	"	099
		19.1		2b	"	"	113
		16.81		6	"	"	136.2
		16.20		4	"	"	144.8
		16.03		4	"	"	146.8
		14.87		8	"	"	159.4
		13.12		6	"	"	178.7
		12.09		6	"	"	189.9
		09.60		2	"	"	217.5
		08.61		8	"	"	228.4
		07.37		4	"	"	242.1
		06.57		4	"	"	250.9
		05.87		4	"	"	258.7
		03.50		8	"	"	285.0
		02.72		2	"	"	293.6
		01.82		4''	"	"	303.6
		01.28		10r	"	"	309.7
		2999.57		2	"	"	328.6
		99.30		2	"	"	331.6
		98.00		2	"	"	346.1
		96.7		2b	"	9.6	360
		96.05		8	"	"	367.7
		94.59		8	"	"	384.0
		89.72		2n	"	"	438.3
		89.67		6	"	"	438.9
		89.35		4	"	"	442.5
		88.07		8	"	"	456.6
		85.25		6	"	"	487.3
		83.62		8	"	"	506.7
		83.10		2	"	"	512.6
		82.82		4	0.84	"	515.7
		82.00		4	"	"	524.9
		81.27		8	"	"	533.1
		79.6		2b	"	"	552
		79.16		2	"	"	556.9
		78.25		4	"	"	567.1
		77.60		2	"	"	574.5



VANADIUM—*continued*.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		2976.55		10r	0.84	9.6	33586.4
		76.20		8	"	"	590.3
		75.70		8	"	"	595.9
		74.06		6	"	"	614.4
		72.31		10	"	"	634.2
		71.65		2	"	"	641.7
		70.53		2	"	9.7	654.3
		69.93		2	"	"	661.1
		68.40		12r	"	"	678.4
		68.15		4n	"	"	681.2
		67.65		2	"	"	687.0
		64.1		2b	"	"	728
		63.34		2	"	"	735.9
		62.87		2	"	"	741.3
		62.10		2	"	"	750.0
		60.87		2	"	"	764.1
		58.68		6	"	"	789.1
		57.74		10	"	"	799.9
		56.70		2	"	"	811.8
		55.65		6	"	"	823.8
		54.45		2	"	"	837.5
		54.02		2	"	"	843.0
		53.85		2	"	"	843.4
		52.12		10r	"	"	864.2
		51.65		4	"	"	869.7
		50.40		8	"	"	884.0
		49.70		2	"	"	892.1
		49.24		8	"	"	897.4
		48.15		8	"	"	909.9
		46.60		2	"	"	927.7
		45.9		2b	"	"	936
		44.68		10r	"	9.8	949.7
		43.70		2	"	"	961.0
		43.25		2	"	"	966.2
		42.48		4	0.83	"	975.1
		41.51		10r	"	"	988.3
		38.35		4	"	"	34022.3
		37.82		2	"	"	029.0
		37.13		4	"	"	037.0
		35.99		2	"	"	050.3
		34.48		8	"	"	067.7
		33.95		4	"	"	073.9
		32.42		8	"	"	091.7
		32.00		4	"	"	096.5
		31.73		4	"	"	099.8
		30.96		8r	"	"	108.7
		30.25		6	"	"	117.0
		29.12		2	"	"	130.1
		26.50		10	"	"	160.7
		25.40		6	"	"	173.5
		24.79		10r	"	"	180.7
		24.14		10r	"	"	188.2
		23.47		6	"	"	196.1
		22.75		2n	"	"	204.6
		20.50		10	"	"	230.9

VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		2920.11		8	0.83	9.8	34235.4
		18.32		6	"	"	256.4
		17.41		8	"	"	267.1
		16.00		6	"	"	283.6
		15.46		6	"	"	290.0
		14.97		4	"	"	295.8
		14.40		6	"	"	302.5
		13.85		2	"	"	309.0
		13.17		2n	"	"	316.9
		12.7		2b	"	"	322.5
		11.78		4	"	"	333.3
		11.17		8r	"	"	340.6
		10.50		8r	"	"	348.5
		10.15		8r	"	"	352.6
		08.96		8r	"	"	366.6
		08.56		6	"	"	371.3
		07.60		8	"	"	382.7
		06.60		8r	"	"	394.5
		05.75		6	"	"	404.6
		05.13		6	"	"	411.9
		04.23		2	"	"	422.6
		03.70		2''	0.82	"	428.9
		03.20		8r	"	"	434.8
		00.06		2	"	"	472.1
		2899.5		2b	"	"	479
		98.02		4	"	"	496.4
		96.98		2	"	10.0	508.8
		96.31		8	"	"	516.7
		95.74		2	"	"	523.5
		94.96		2	"	"	532.8
		94.78		2	"	"	534.9
		93.47		10r	"	"	550.5
		92.82		10r	"	"	558.3
		92.51		6	"	"	562.0
		91.78		10r	"	"	570.8
		90.69		4	"	"	583.8
		90.28		4	"	"	588.7
		89.71		10r	"	"	595.6
		88.36		10	"	"	611.6
		87.30		4	"	"	624.4
		87.08		4	"	"	627.1
		84.91		12r	"	"	653.1
		84.20		4	"	"	661.7
		82.60		10	"	"	680.9
		80.92		6	"	"	701.1
		80.14		10	"	"	710.5
		79.26		6	"	"	721.1
		78.40		2	"	"	731.5
		78.13		2	"	"	734.8
		77.80		8	"	"	738.8
		77.05		4	"	"	747.8
		75.78		6	"	"	763.2
		74.34		2	"	"	780.6
		73.30		6	"	"	793.2
		71.61		2	"	"	813.5

VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haachek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		2870.66		2	0.82	10.1	34825.1
		70.27		4	"	"	829.3
		70.08		4	"	"	832.1
		69.22		12	"	"	842.6
		68.24		2	"	"	854.4
		66.75		2n	"	"	872.6
		66.57		2n	"	"	874.8
		64.60		8	0.81	"	898.7
		64.0		2b	"	"	906
		63.1		2b	"	"	917
		62.41		4	"	"	923.5
		61.53		2	"	"	935.2
		60.11		2	"	"	953.0
		58.1		2n	"	"	968
		55.39		6	"	"	35011.3
		54.41		12	"	"	023.4
		53.85		2	"	"	040.3
		53.01		2n	"	"	040.5
		52.63		6	"	"	045.2
		51.36		4	"	"	060.8
		50.33		10	"	"	073.5
		49.19		8	"	"	087.5
		47.65		10	"	10.2	106.4
		46.70		2	"	"	118.1
		46.40		2	"	"	121.8
		45.37		8	"	"	134.6
		44.95		2	"	"	139.8
		44.4		2n	"	"	147
		43.97		4n	"	"	151.9
		43.35		2	"	"	159.5
		42.83		2	"	"	166.0
		42.50		2n	"	"	170.1
		42.2		2n	"	"	174
		41.20		8	"	"	186.1
		40.72		4	"	"	192.1
		40.24		4	"	"	198.0
		39.52		2	"	"	207.0
		38.64		2	"	"	217.9
		38.16		4	"	"	223.8
		36.62		8	"	"	243.0
		35.7		2n	"	"	254
		35.55		4n	"	"	256.3
		34.75		6n	"	"	266.2
		32.55		2	"	"	293.6
		31.8		4b <sup>v</sup>	"	"	303
		31.15		2n	"	"	311.1
		30.9		2b	"	"	314
		30.52		6	"	"	319.0
		28.75		2	"	"	341.1
		27.1		2n	"	"	362
		26.02		8n	"	"	375.2
		25.20		2n	"	"	385.5
		24.59		2	0.80	"	393.1
		22.6		8b <sup>v</sup>	"	10.3	419
		21.26		6	"	"	434.8

VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		2819.56		6	0.80	10.3	35456.2
		18.70		2n	"	"	467.0
		17.61		8	"	"	481.7
		16.30		2n	"	"	497.2
		15.70		2	"	"	504.8
		15.10		2	"	"	512.3
		15.03		4	"	"	513.1
		14.40		2	"	"	521.3
		13.41		2	"	"	533.8
		12.9		2n	"	"	540
		12.32		2	"	"	547.5
		12.12		2	"	"	550.1
		11.74		2	"	"	554.9
		10.39		12	"	"	571.9
		09.66		6	"	"	581.2
		08.85		2	"	"	591.5
		08.39		6	"	"	597.3
		08.2		2n	"	"	600
		07.05		2n	"	"	614.4
		06.95		2	"	"	615.6
		06.67		2	"	"	619.1
		06.2		2b	"	"	626
		05.69		6	"	"	631.6
		04.58		2	"	"	645.6
		03.60		10	"	"	658.4
		02.93		8	"	"	666.6
		01.15		6n	"	"	689.3
		00.23		2	"	"	701.0
		2799.59		10	"	"	709.0
		98.88		8	"	10.4	718.2
		98.40		2	"	"	724.3
		97.93		8	"	"	730.4
		97.60		2n	"	"	734.5
		97.12		8	"	"	740.6
		95.61		4	"	"	760.0
		95.02		4b	"	"	767.5
		94.50		2n	"	"	774.2
		94.02		2	"	"	780.3
		92.6		2b <sup>v</sup>	"	"	798.5
		91.7		4b <sup>v</sup>	"	"	810
		90.2		2b	"	"	829
		88.8		2b	"	"	847
		88.11		6n	"	"	856.2
		87.2		4b	"	"	868
		87.18		4	"	"	868.1
		86.0		4b	"	"	883
		84.40		8b	"	"	904.0
		84.1		2b	"	"	907
		83.12		2	0.79	"	920.5
		82.70		2	"	"	925.9
		81.69		12n	"	"	939.0
		80.25		2b	"	"	957.6
		78.75		8b <sup>v</sup>	"	"	977.0
		78.23		2	"	"	983.7
		77.86		10	"	"	988.5



VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		2776.4		2n	0.79	10.4	36007
		75.69		8	"	"	016.6
		75.11		4	"	10.5	026.0
		74.81		6	"	"	028.0
		74.40		8	"	"	033.3
		73.82		2	"	"	040.9
		72.2		10b <sup>v</sup>	"	"	062
		71.60		8n	"	"	069.7
		71.12		2	"	"	075.9
		69.84		6	"	"	092.7
		68.69		10	"	"	107.7
		68.24		6	"	"	113.4
		67.25		6n	"	"	126.4
		66.59		10	"	"	135.1
		65.81		14b <sup>v</sup>	"	"	145.2
		64.45		2n	"	"	165.0
		63.8		2n	"	"	171.5
		62.7		4n''	"	"	186
		61.53		2n	"	"	201.3
		60.62		10r	"	"	213.3
		60.26		8	"	"	218.0
		59.25		6n	"	"	231.3
		58.95		4	"	"	235.2
		58.67		4n	"	"	238.9
		56.7		4n	"	"	265
		56.5		4n	"	"	267
		55.20		4n	"	"	284.5
		53.54		16b <sup>v</sup>	"	"	306.4
		52.27		4n	"	"	323.1
		51.93		4n	"	"	336.0
		50.2		4b	"	10.6	350
		48.6		2n	"	"	371.5
		47.55		10	"	"	385.5
		46.00		2	"	"	406.0
		44.63		2	"	"	424.2
		43.85		4	"	"	434.5
		42.80		6	"	"	448.5
		42.53		6	"	"	452.1
		41.69		2	0.78	"	463.2
		41.1		4b	"	"	471
		39.80		8	"	"	488.4
		39.30		4n	"	"	495.1
		37.42		2	"	"	519.7
		36.78		2	"	"	528.7
		36.28		2n	"	"	535.4
		35.55		2n	"	"	545.1
		34.43		4n	"	"	560.1
		34.05		4	"	"	565.2
		33.8		2n	"	"	568.5
		33.15		4n	"	"	577.2
		32.35		4n	"	"	588.0
		31.50		2	"	"	599.3
		31.30		2	"	"	602.0
		29.81		10	"	"	622.0
		28.06		2	"	"	645.5

VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		2726·67		6	0·78	10·6	36664·1
		24·80		2	"	"	689·2
		24·52		2	"	"	693·0
		23·59		6	"	"	705·5
		23·34		6	"	"	708·9
		22·73		2	"	"	717·1
		22·40		2	"	"	721·6
		21·9		2n	"	"	728
		21·30		2	"	"	736·4
		20·35		2n	"	"	749·3
		18·55		2n	"	"	773·6
		18·1		2n	"	"	780
		17·56		2	"	"	787·0
		15·80		16	"	"	810·9
		15·20		2n	"	"	819·0
		14·31		6	"	"	831·1
		13·20		6	"	"	886·1
		13·0		4n	"	"	849
		12·4		8n	"	"	857
		11·88		10	"	"	864·1
		10·30		4	"	"	885·6
		09·2		2b	"	"	900·5
		08·68		2	"	"	907·7
		08·00		10	"	"	916·9
		06·87		10	"	"	932·3
		06·34		8	"	"	939·6
		06·24		8	"	10·7	940·0
		05·34		6	"	"	953·2
		03·26		2	"	"	981·6
		02·31		14	"	"	994·7
		01·66		2	"	10·8	37003·5
		01·16		10	"	"	010·3
		01·01		6	"	"	012·3
		2699·82		2n	"	"	027·7
		99·27		2	"	"	036·3
		98·83		2	0·77	"	042·3
		97·86		2	"	"	055·6
		97·31		4	"	"	063·2
		97·16		2n	"	"	065·2
		96·65		4n	"	"	072·3
		94·85		6n	"	"	097·0
		94·6		2n	"	"	100·5
		93·1		2n	"	"	121·2
		90·91		12	"	"	151·4
		90·41		10	"	"	158·3
		89·99		10	"	"	164·1
		88·82		10	"	"	180·2
		88·12		10	"	"	189·9
		87·90		8	"	"	193·0
		87·7		6b	"	"	196
		86·60		2	"	"	211·0
		85·77		6	"	"	222·5
		85·22		6	"	"	230·1
		84·91		6	"	"	234·4
		83·5		2b	"	"	254

VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		2683.21		10	0.77	10.8	37253.0
		82.98		10	"	"	261.2
		82.60		2	"	"	266.5
		80.54		4	"	"	295.1
		79.39		14	"	"	311.1
		78.66		12	"	10.9	321.2
		77.91		12	"	"	331.7
		77.25		2	"	"	340.8
		76.3		4b	"	"	354
		74.27		2nr	"	"	382.5
		73.40		8n	"	"	394.6
		72.11		14	"	"	412.7
		70.38		10	"	"	436.9
		69.08		2	"	"	455.1
		68.70		2	"	"	460.5
		68.18		4n	"	"	467.8
		67.65		2	"	"	475.3
		66.9		4b	"	"	486
		66.10		2	"	"	497.0
		65.5		2n"	"	"	505.5
		63.42		18	"	"	534.8
		62.45		2	"	"	548.5
		61.67		10	"	"	559.5
		59.74		8	"	"	586.7
		59.10		8	"	"	597.7
		58.62		4	"	"	602.6
		57.40		6	"	"	619.9
		55.82		16	"	"	642.3
		54.50		2n	0.76	"	661.0
		53.94		2	"	11.0	668.8
		52.90		10	"	"	683.6
		52.03		2n	"	"	695.9
		51.70		2n	"	"	700.6
		51.1		2n	"	"	709
		50.55		2n	"	"	717.0
		49.50		16	"	"	732.0
		48.04		12	"	"	752.8
		47.82		4	"	"	755.9
		47.37		2n	"	"	762.3
		46.3		2n	"	"	778
		45.90		14	"	"	783.3
		45.38		2n	"	"	790.7
		44.50		16	"	"	803.3
		43.8		4b	"	"	813
		43.23		4	"	"	821.5
		42.82		4	"	"	827.4
		42.32		14	"	"	834.5
		41.05		16	"	"	852.7
		40.40		2	"	"	861.0
		38.65		4b	"	"	887.2
		38.02		4	"	"	896.2
		37.81		4	"	"	899.2
		37.30		2n	"	"	906.6
		36.13		2n	"	"	923.1

VANADIUM—*continued*.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		2635.73		6	0.76	11.0	37929.1
		35.52		4n	"	"	932.2
		34.64		2n	"	"	944.8
		34.02		2n	"	"	953.7
		33.31		2n	"	"	964.0
		32.50		2n	"	"	975.7
		30.72		12	"	11.1	38001.3
		29.88		10n	"	"	013.4
		28.88		8n	"	"	027.9
		28.35		2n	"	"	035.6
		28.2		2n	"	"	038
		25.73		2	"	"	073.5
		25.00		8n	"	"	084.1
		23.86		8n	"	"	100.7
		22.85		8n	"	"	115.4
		21.9		8b	"	"	129
		20.4		2b	"	"	151
		20.2		2b	"	"	154
		19.55		2n	"	"	163.7
		18.3		2b	"	"	178
		17.28		6n	"	"	196.5
		16.75		6n	"	"	204.2
		16.31		8	"	"	210.6
		15.50		8n	"	"	222.5
		14.49		6	"	"	237.3
		13.9		4b	"	"	246
		12.4		4b	"	"	268
		11.6		4n	"	"	280
		11.35		6n	"	"	283.3
		10.8		8b	"	"	291
		2509.91		2	0.75	"	304.4
		09.68		2	"	11.2	307.8
		08.11		6n	"	"	330.7
		07.5		2n	"	"	340
		06.60		2n	"	"	353.0
		05.8		4b	"	"	365
		03.52		6n	"	"	398.3
		03.05		6n	"	"	405.2
		02.40		4n	"	"	414.8
		01.20		8n	"	"	432.5
		00.65		2n	"	"	440.7
		00.15		2	"	"	448.1
		98.9		2n	"	"	467
		97.33		4	"	"	489.8
		96.55		2n	"	"	501.5
		95.20		16	"	"	521.4
		94.0		2n	"	"	539
		93.8		2n	"	"	542
		93.18		16	"	"	549.9
		92.32		2	"	"	564.3
		91.68		2	"	"	573.8
		91.3		2b	"	"	579
		90.7		2b	"	"	588
		90.3		2b	"	"	594
		88.89		2	"	"	614.4



VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda}$	
		2588.55		2	0.75	11.2	38620.5
		88.22		2	"	11.3	625.3
		87.5		4b	"	"	636
		85.02		10	"	"	673.1
		83.7		2b	"	"	693
		83.12		6	"	"	701.5
		81.95		2	"	"	719.1
		78.53		4	"	"	770.4
		77.78		10	"	"	781.7
		77.39		2	"	"	787.5
		76.56		6	"	"	800.1
		76.20		2	"	"	805.5
		74.61		10	"	"	829.5
		74.14		4	"	"	836.6
		73.3		4b	"	"	849
		72.85		4n	"	"	856.1
		72.0		6b	"	"	869
		71.14		10	"	"	881.9
		68.47		4n	"	11.4	922.3
		68.18		2	"	"	926.6
		67.6		4b	"	"	935.5
		66.70		6n	"	"	949.2
		66.13		4	"	"	957.9
		65.8		2n	"	"	963
		65.65			"	"	965.1
		65.32			"	"	970.2
		64.90			0.74	"	976.5
		64.25		6n	"	"	986.4
		63.45		6b	"	"	998.6
		62.87		6	"	"	39007.4
		62.3		4b	"	"	016
		61.3		2b	"	"	031
		60.25			"	"	047.4
		59.20		2n	"	"	063.4
		58.99		2	"	"	066.5
		56.87		2	"	"	098.9
		56.00		1	"	"	112.2
		55.6		2b	"	"	118
		54.93		2	"	"	128.6
		54.30		14	"	"	138.3
		53.76		8	"	"	146.6
		53.11		12	"	"	156.6
		52.75		2n	"	"	162.1
		52.35		2n	"	"	168.2
		51.33		6	"	"	176.6
		50.7		2n	"	"	194
		49.76		4	"	"	208.0
		49.36		14	"	"	214.2
		48.80		12	"	11.5	222.7
		48.28		14	"	"	230.7
		46.40		2	"	"	259.6
		46.00		2	"	"	265.8
		45.79		2	"	"	269.1
		45.54		4	"	"	272.9
		44.40		4n	"	"	290.5

VANADIUM—*continued*.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		2543.75		2	0.74	11.5	39300.5
		43.05		2	"	"	311.4
		42.6		10b	"	"	318
		41.90		2	"	"	329.2
		41.1		2b	"	"	341.5
		39.3		8b	"	"	369
		37.67		6	"	"	394.7
		35.20		2	"	"	433.1
		34.60		8	"	"	442.5
		34.34		2	"	"	446.5
		34.04		4	"	"	451.2
		33.93		4	"	"	452.9
		32.07		4 br	"	"	481.9
		31.71		2	"	"	487.5
		31.33		2	"	"	493.4
		30.22		4	"	11.6	510.7
		28.97		14	"	"	530.2
		28.59		14	"	"	536.1
		28.00		18	"	"	545.4
		26.80		16	"	"	564.2
		25.63		2	"	"	582.5
		25.44		2	"	"	585.4
		25.07		10	"	"	591.2
		23.76		4	"	"	611.8
		23.50		2	"	"	615.9
		22.95		2	"	"	624.5
		22.60		6	"	"	630.1
		22.50		4	"	"	631.7
		21.62		12	"	"	645.6
		21.30		10	"	"	650.5
		20.85		2n	"	"	657.6
		20.40		2n	"	"	664.6
		19.77		6n	"	"	674.9
		19.2		2b	"	"	683.5
		18.7		2b	"	"	691
		18.07		2n	"	"	701.3
		17.54		2	0.73	"	709.7
		17.20		4	"	"	715.1
		16.19		14	"	"	731.0
		15.76		2	"	"	737.8
		15.20		2	"	"	746.6
		14.70		12	"	"	754.6
		13.7		2b	"	"	770
		13.43		2n	"	"	774.6
		12.95		2n	"	"	782.3
		12.5		2b	"	"	789
		12.05		4	"	11.7	796.5
		11.74		4	"	"	801.3
		11.3		2b	"	"	808
		10.90		2	"	"	814.6
		10.37		2	"	"	823.0
		09.91		2	"	"	830.4
		08.93		2	"	"	845.8
		07.87		4	"	"	862.8
		07.70		6	"	"	865.5

VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda}$	
		2506.97		4	0.73	11.7	39877.1
		06.27		10	"	"	888.2
		05.63		2	"	"	898.4
		05.32		2	"	"	903.9
		05.02		2	"	"	908.1
		04.34		4	"	"	918.9
		03.98		2	"	"	924.7
		03.33		2n	"	"	935.1
		03.08		10	"	"	939.0
		02.44		2	"	"	949.3
		01.67		4	"	"	961.6
		01.20		2	"	"	969.1
		00.10		2n	"	"	986.7
		2499.30		2	"	"	999.4
		99.12		2	"	"	40002.3
		98.3		2b	"	"	015
		97.08		2	"	"	035.0
		95.85		2	"	"	054.7
		94.20		2n	"	"	081.2
		93.66		4	"	"	089.9
		92.4		2b	"	"	110.3
		91.24		2	"	11.8	128.9
		90.74		2	"	"	136.9
		89.86		2	"	"	151.1
		88.66		4	"	"	170.5
		88.20		4	"	"	177.9
		87.6		2b	"	"	188
		85.55		2	"	"	220.7
		84.27		2	"	"	241.5
		83.40		2	"	"	255.5
		83.11		10	"	"	260.3
		82.39		10	"	"	272.0
		80.68		2n	"	"	299.7
		79.60		12	"	"	317.3
		79.09		12	"	"	325.5
		78.64		8	"	"	332.9
		76.33		4	"	11.9	370.4
		75.92		6	"	"	377.1
		75.49		6	"	"	384.1
		74.8		2b	"	"	395
		72.94		2	"	"	425.8
		71.18		6	"	"	454.6
		69.85		2n	0.72	"	476.4
		69.46		2	"	"	482.8
		68.69		2	"	"	495.4
		65.34		10	"	"	550.5
		64.14		6	"	"	570.2
		62.99		8	"	"	589.2
		61.57		8	"	"	612.5
		60.65		2n	"	"	627.7
		59.40		4	"	12.0	648.3
		59.31		2	"	"	649.8
		58.35		8	"	"	665.7
		57.85		2	"	"	674.0
		57.50		8	"	"	679.7

## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		2456.56		2	0.72	12.0	40695.6
		53.90		2	"	"	739.5
		53.41		10	"	"	747.5
		52.83		2	"	"	757.2
		52.1		2b	"	"	769
		51.6		2b	"	"	778
		50.80		2	"	"	791.0
		50.69		2	"	"	792.8
		50.29		4	"	"	799.5
		48.50		2	"	"	829.3
		47.70		10	"	"	842.7
		46.75		8	"	"	858.5
		45.61		2	"	"	877.6
		45.38		2	"	"	881.4
		45.00		10b <sup>v</sup>	"	"	887.8
		42.65		2n	"	12.1	927.0
		41.96		2	"	"	938.8
		41.71		2	"	"	942.8
		41.40		2	"	"	948.0
		39.81		2	"	"	974.7
		39.35 Fe		6	"	"	982.4
		39.17		2	"	"	985.4
		39.09		4	"	"	41003.5
		36.62		2	"	"	028.4
		35.56		4	"	"	046.2
		33.05		6	"	"	088.5
		32.06		2	"	"	105.3
		31.65		2	"	"	112.3
		30.10		10	"	"	138.5
		28.35		4	"	"	168.1
		27.80		4	"	12.2	177.4
		27.37		6	"	"	184.7
		26.18		2	"	"	205.0
		24.83		2n	"	"	227.8
		24.23		2	"	"	248.1
		23.47		2	"	"	251.0
		23.27 Fe		2	"	"	254.4
		23.11		2	"	"	257.1
		22.06		4	"	"	275.0
		21.15		4	0.71	"	290.6
		20.20		4	"	"	306.7
		18.80		2	"	"	330.6
		17.60		10br	"	"	361.2
		16.84		4	"	"	366.4
		15.40		2	"	"	388.8
		15.23		4	"	"	391.8
		14.00		14	"	"	412.8
		13.15		2	"	"	427.4
		12.80		4	"	12.3	433.3
		08.53		4	"	"	506.8
		08.01		2	"	"	515.8
		07.70		2	"	"	521.1
		07.25		12	"	"	528.9
		05.96		2	"	"	551.2
		05.30		16	"	"	562.7



VANADIUM—*continued.*

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda}$	
		2403.35		4	0.71	12.3	41596.4
		02.01		4	"	"	619.6
		00.99		4	"	"	637.5
		2399.77		12	"	"	658.4
		98.22		2n	"	"	685.3
		97.74		2	"	"	693.7
		97.2		2n	"	"	703
		97.1		2n	"	"	705
		96.62		2	"	12.4	713.1
		95.1		2n	"	"	740
		93.70		18	"	"	763.9
		92.8		2n	"	"	780
		91.33		2	"	"	805.4
		90.56		4	"	"	818.8
		89.79		8	"	"	832.3
		89.01		2	"	"	845.9
		88.35		2	"	"	857.1
		88.0		2b	"	"	864
		87.04		2	"	"	880.5
		86.51		2	"	"	889.9
		85.92		6	"	"	900.2
		85.70		4	"	"	904.0
		85.05		2b	"	"	915.4
		84.09		8	"	"	932.5
		83.55		2n	"	"	941.9
		82.59		16	"	"	958.8
		81.00		10	"	12.5	986.7
		80.3		2n	"	"	999
		79.24		10	"	"	42017.8
		77.0		2b	"	"	057
		75.9		2n	"	"	077
		74.75		2	"	"	097.2
		74.2		2n	"	"	108
		73.15		10	0.70	"	125.6
		72.67		2	"	"	132.4
		72.25		6	"	"	159.5
		71.19		18	"	"	160.6
		67.71		6	"	"	222.4
		66.96		2	"	"	235.7
		66.53		4	"	"	243.5
		66.40		16	"	"	245.8
		65.73		2	"	"	257.3
		62.71		4	"	"	311.7
		60.42		6	"	"	352.8
		58.82		14	"	12.6	381.6
		57.89		6	"	"	398.2
		57.60		2b	"	"	403.4
		56.3		2n	"	"	427
		55.3		2	"	"	445
		54.74		4	"	"	455.0
		52.25		10	"	"	500.0
		51.64		6	"	12.7	510.9
		51.33		4	"	"	516.5
		49.87		8	"	"	542.9
		49.37		2n	"	"	543.8

## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		2348.30		8	0.70	12.7	42571.5
		47.57		2	"	"	584.8
		47.20		8	"	"	591.3
		46.92		6	"	"	596.4
		46.41		10	"	"	605.8
		43.91		6	"	"	651.0
		43.20		10	"	"	664.2
		42.26		10	"	"	681.2
		41.49		2	"	"	695.3
		40.6		2b	"	"	711
		39.9		2n	"	"	724
		39.02		2	"	12.8	740.3
		37.46		6	"	"	768.8
		37.28		8	"	"	772.1
		36.20		6	"	"	791.8
		35.59		6	"	"	803.0
		35.44		2	"	"	805.8
		34.30		10	"	"	826.8
		33.70		6	"	"	833.6
		31.86		10	"	"	871.4
		31.38		6	"	"	880.4
		30.53		12	"	"	896.0
		30.3		6n	"	"	900
		29.03		8	"	"	923.8
		28.2		2b	"	"	939.0
		26.13		4	"	12.9	977.1
		25.22		10	0.69	"	993.9
		23.92		12	"	"	43017.8
		19.91		4	"	"	092.2
		19.07		8	"	"	107.8
		18.10		10	"	"	125.9
		17.61		6	"	"	135.0
		16.8		2b	"	"	150
		15.8		2b	"	"	169
		15.07		2	"	"	182.3
		14.25		8	"	"	197.8
		12.5		2b	"	"	230
		11.40		8	"	13.0	251.0
		09.91		8	"	"	278.7
		09.14		2	"	"	293.3
		08.87		2	"	"	298.2
		08.35		2b	"	"	308.1
		06.45		2n	"	"	343.8
		04.82		2	"	"	374.3
		03.29		2	"	"	403.2
		02.30		2	"	"	421.8
		2297.91		8	"	"	504.8
		96.93 C?		4	"	"	523.3
		96.39		2	"	13.1	533.6
		95.91		2	"	"	542.6
		95.65		4	"	"	547.6
		95.55		4	"	"	549.5
		95.03		6	"	"	559.4
		92.91		8	"	"	599.6
		92.64		6	"	"	604.8

## VANADIUM—continued.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda} -$	
		2291.5		2n	0.69	13.1	43626
		90.62		6	"	"	636.7
		89.27		4	"	"	656.4
		88.69		4	"	"	674.7
		88.12		4	"	"	691.1
		87.99		4	"	13.2	693.3
		85.50		6	"	"	740.9
		84.98		2	"	"	750.9
		84.80		2	"	"	754.4
		84.6		2n	"	"	758
		83.85		4	"	"	772.5
		83.42		4	"	"	780.8
		82.92		2	"	"	790.3
		81.66		4	"	"	814.6
		81.27		4	"	"	822.0
		80.38		4	"	"	847.1
		79.78		4	"	"	850.7
		79.40		2	"	"	858.0
		78.99		4	"	"	865.9
		78.16		2	"	"	882.1
		75.97		2	0.68	"	924.1
		75.62		2	"	"	930.9
		75.28		4	"	"	937.5
		73.69		2	"	13.3	968.1
		73.09		4	"	"	978.2
		71.92		2	"	"	41002.3
		71.22		2	"	"	015.8
		69.2		2n	"	"	055
		68.35		4	"	"	069.0
		67.7		2n	"	"	084
		64.43		2	"	"	147.9
		63.7		2n	"	"	162
		62.44		2	"	13.4	186.8
		61.9		2	"	"	197
		61.44		2	"	"	212.3
		60.90		2	"	"	216.8
		58.83		4	"	"	257.3
		57.04		2	"	"	292.5
		53.00		2	"	"	371.9
		51.60		2	"	"	399.5
		51.20		2	"	"	407.4
		50.8		2n	"	"	415
		50.50		2n	"	13.5	421.1
		49.13		6	"	"	448.1
		43.50		2	"	"	543.8
		41.57		8	"	"	598.2
		40.66		4	"	"	616.1
		37.25		2	"	13.6	684.2
		32.97		10	"	"	769.8
		30.05		4	"	"	828.4
		29.81		4	0.67	"	833.3
		28.33		4	"	"	863.2
		22.79		4	"	13.7	974.8
		21.58		2	"	"	999.2
		20.29		2	"	"	45025.5

VANADIUM—*continued*.

Arc Spectrum		Spark Spectrum	Intensity and Character		Reduction to Vacuum		Oscillation Frequency in Vacuo
Hasselberg	Rowland and Harrison	Exner and Haschek	Arc	Spark	$\lambda +$	$\frac{1}{\lambda}$	
		2218.51		6	0.67	13.7	45061.5
		18.07		4	"	"	070.5
		17.48		6	"	"	082.3
		16.11		6	"	"	110.6
		15.92		2n	"	"	114.3
		14.11		6	"	13.8	151.3
		10.40		2	"	"	226.8
		10.10		2	"	"	233.0
		09.31		4	"	"	249.3
		09.02		4	"	"	255.3
		07.83		2	"	"	279.6
		04.60		2	"	"	345.9
		02.62		4	"	13.9	386.3
		01.77		4	"	"	446.1
		2199.72		2	"	"	446.4
		99.57		2	"	"	449.5
		98.66		2	"	"	468.8
		98.13		2	"	"	479.3
		95.82		2n"	"	"	527.1
		94.98		2	"	"	544.6
		93.03		2	"	"	585.2
		91.20		2	"	"	608.0
		90.60		2	"	14.0	639.6
		90.30		2	"	"	641.8
		87.00		2	"	"	710.7
		86.02		2	"	"	731.1
		85.45		2	"	"	743.2
		84.25		2	"	"	768.3
		82.30		2n	"	"	809.1
		81.95		2	"	"	816.6
		77.3		2n	0.66	"	915
		77.0		2n	"	14.1	921
		75.9		2	"	"	944
		73.2		2	"	"	46001
		71.9		2	"	"	047.5
		66.2		2n	"	"	134
		63.7		2n	"	14.2	207
		61.6		2n	"	"	248
		51.9		2	"	"	456
		51.1		2	"	14.3	474
		50.9		2	"	"	478
		48.4		2	"	"	532
		47.5		2	"	14.4	551
		46.0		2	"	"	584
		43.1		2	"	"	627
		42.0		2	"	"	671
		40.1		2	"	"	712.5
		39.8		2	"	14.5	719
		38.1		2	"	"	756
		37.3		4	"	"	774
		34.1		4	"	"	844
		33.0		2	"	"	868
		31.8		2	"	"	894



# INFRA RED ARC SPECTRA OF THE ALKALIES, &c.

Lehmann, 'Archiv für wissenschaftliche Photographie,' November 1900.

\* Recorded also by Abney, 'Proc. Roy. Soc.,' vol. xxxii. p. 483 (1881).

† Recorded also by Lewis, 'Astrophys. J.,' vol. ii. p. 106 (1895).

‡ Recorded also by Becquerel, 'Ann. Chim. Phys.,' vol. xxx. p. 43 (1883).

|| Recorded also by Snow, 'Wied. Ann.,' vol. xlvii. p. 208 (1892). See also Index, pp. 26, 121-130.

Wave-length	Intensity	Wave-length	Intensity	Wave-length	Intensity
Barium		Sodium		Calcium	
893	3	†*819	1	‡†*866	2
887	8	†*818	1	‡†*854	1
881	7			‡†849	3
865	10			761	8
858	10			760	8
856	1	Rubidium		732	2
852	10	851	1	720	1
832	10	795	2	715	3
828	9	780	1		
827	10	775	6	Iron	
821	1	763	7	869	8
816	9			866	8
815	8			839	5
809	10	Caesium		834	5
807	10	920	5	823	2
806	10	917	3	808	8
802	7	895	2	804	5
798	6	876	2	799	4
796	6	852	1	794	2
794	6	812	7	793	2
791	5	808	5	783	2
788	8	802	5	778	2
784	4	795	2	775	2
777	1	780	1	771	6
776	10	761	5	762	8
774	5			Magnesium	
772	8	Potassium		†911	10
771	1	794	5	892	8
767	1	779	3	880	1
764	2			853	2
761	2			850	2
Lithium				795	1
†812	1			778	5

# APPENDIX N

## RADIUM (FLAME SPECTRUM).

Runge and Precht, 'Ann. d. Physik,' x. 1903, p. 655.

Wave-length	Intensity	Wave-length	Intensity	Wave-length	Intensity
6861	?	6247		5130	
6653	Q	6228		to	
6700		6216		5090	wb
to	Qb	6210		4826	Qs
6530		6050		4750	
6349	Q	to	wb	4718	
6329	Q	5900		4680	w
6285		5685		4592	n
6269		5655		4500	wn
6260		5360		4405	w?
6250	Qb	5210			

## INFRA-RED ARC SPECTRA OF THE ALKALIES.

Lehmann, 'Ann. d. Physik,' v. 1901, p. 633.

Wave-length	Intensity	Reduction to Vacuum		Oscillation Frequency
		$\lambda +$	$\frac{1}{\lambda}$	
POTASSIUM.				
7701.92	10	2.08	3.5	12981.7
7668.54	10	"	3.6	13036.7
RUBIDIUM.				
8513.26	4		3.2	11743.0
7950.46	8	2.15	3.4	12575.2
7805.98	10	2.11	3.5	12807.7
7753.58	6	2.10	"	12893.8
7626.66	6	2.07	"	13109.0
7406.19	4	2.01	3.7	13497.5
7277.01	4	1.97	"	13738.1
CÆSIUM.				
9211.86	6		3.0	10853.1
9171.38	6		"	10900.0
8949.92	8		3.1	11171.1
8766.10	8		"	11404.1
8527.72	18		3.2	11724.1
8082.02	6	2.19	3.4	12368.8
8019.62	6	2.17	"	12465.7
7616.58	6	2.06	3.6	13125.7
7227.46	4	1.96	3.7	13833.1

Q signifies 'strong,' w 'weak,' ? 'uncertain.'

## THORIUM (ULTRA-VIOLET SPARK SPECTRUM).

Exner and Haschek, 'Sitzber. kaiserl. Akad. Wissensch. Wien,' cviii. 1899.  
Lohse, Berl. Akad., 1897.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
4740.70	2		1.30	5.8	21088.1
40.0	1n		"	"	091
32.9	1n		"	"	123
30.00	1		"	"	135.8
24.55	1		1.29	"	160.2
23.93	1		"	"	163.0
23.60	1		"	"	164.5
20.17	1		"	"	179.9
18.79	1		"	"	186.2
15.60	1		"	"	200.4
12.57	1		"	"	215.0
08.27	1		"	"	233.4
06.41	1		"	5.9	241.7
05.92	2		"	"	243.9
02.55	1		"	"	259.1
00.35	1		"	"	269.1
4695.05	1n		"	"	293.1
94.25	2		"	"	296.7
91.25	2		"	"	310.4
90.87	1		1.28	"	312.1
89.33	1		"	"	319.1
85.65	1n		"	"	335.8
80.81	1		"	"	357.9
66.69	1		"	"	422.7
52.2	1n		"	"	490
51.76	2		1.27	"	491.4
41.35	1		"	"	539.7
40.26	1		"	"	544.8
39.86	1		"	"	546.5
34.00	1		"	6.0	573.6
31.94	2	4631.70	"	"	583.2
27.8	1n		"	"	602.5
26.8	1n		"	"	607
25.24	1		"	"	611.7
24.22	1n		"	"	616.5
24.05	1n		"	"	620.0
19.67	3	4619.60	"	"	640.6
12.71	1		"	"	673.2
12.06	1		"	"	676.3
10.00	1		"	"	686.0
09.53	2		"	"	688.2
06.69	1		"	"	701.5
05.42	1n		"	"	706.5
03.05	1		"	"	718.7
4599.55	1n		"	"	733.2
97.75	2b		"	"	743.8
95.66	1		"	"	753.6
94.69	1n		"	"	758.3
93.65	1n		"	"	763.2
93.48	1n		"	"	764.0
92.97	1n		"	"	766.4

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4589.9	ln	4589.37	1.27	6.0	21781
89.31	4		"	"	786.6
88.40	1		"	"	788.1
87.95	ln		"	"	790.2
87.47	ln		"	"	792.5
86.80	ln		"	"	795.7
86.44	1		"	"	797.4
84.55	1		"	"	806.4
83.9	ln		"	"	809.5
82.67	ln		"	"	815.3
81.78	1		"	"	819.6
81.42	1		"	"	821.3
79.5	ln		"	"	830.5
79.25	ln		"	"	831.7
75.61	1		"	"	849.0
73.90	1		"	"	857.2
69.20	1		"	"	879.7
66.85	1		"	"	890.9
64.35	1		"	6.1	902.8
63.48	5	4563.55	"	"	907.0
62.7	ln	4555.88	"	"	911
55.82	8		"	"	943.8
54.9	lb }	54.31	"	"	947
54.08	1 }		"	"	952.2
53.25	1		"	"	956.2
52.5	ln		"	"	960
51.70	1		"	"	963.7
50.55	1		"	"	969.3
47.0	ln		"	"	986
46.3	ln		"	"	991
46.0	ln		"	"	991
44.70	2		"	"	997.6
43.42	ln	37.24	"	"	22003.7
42.55	ln		"	"	008.0
41.8	ln		"	"	012
40.60	2		"	"	017.4
39.00	1		"	"	025.2
37.26	2		"	"	033.6
36.63	1		"	"	036.7
34.30	2		"	"	048.5
33.50	3	33.55	"	"	051.9
32.47	2	32.54	"	"	056.9
31.90	2	31.89	"	"	059.7
29.67	1	31.89	"	"	070.6
29.06	1		"	"	073.5
28.6	ln		"	"	076
27.93	1		"	"	079.1
26.23	1		"	"	087.3
25.31	1		"	"	091.8
25.04	1		"	"	093.1
23.00	1		"	"	103.1
21.5	ln		"	"	111
21.2	ln		"	"	112
19.98	1	31.89	"	"	117.9
18.85	1		"	"	123.4



THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4518.40	2n	10.78	1.27	6.1	22125.6
17.24	1		"	"	136.1
16.20	2		"	"	139.4
13.91	1		"	"	147.6
12.70	2		"	"	153.5
10.73	5		"	"	163.3
08.9	1n		"	"	172
08.4	1n		"	"	175
00.21	2		"	"	215.1
4499.13	1n		"	"	220.4
96.53	2		"	6.2	233.2
95.45	1n		"	"	238.4
95.13	1		"	"	240.1
93.57	1		"	"	247.9
92.45	1		"	"	253.5
92.02	1n		"	"	255.5
90.5	1n		"	"	263
89.7	1n		"	"	267
88.83	3		"	"	271.3
87.67	3	4487.59	"	"	277.1
86.80	2	83.23	"	"	281.4
85.99	1		"	"	285.4
84.44	1		"	"	293.1
81.85	1		"	"	306.0
81.37	1		"	"	308.4
81.02	2	76.83	"	"	310.1
79.36	1		"	"	318.4
77.1	1n		"	"	330
75.43	1		"	"	338.0
74.25	2	74.37	"	"	343.9
72.47	1	65.73	"	"	352.8
71.97	1		"	"	355.3
65.52	4		"	"	387.6
63.3	1n		"	"	399
61.91	2		"	"	405.7
61.28	2	61.43	"	"	408.8
57.65	1n	55.19	"	"	427.2
57.35	1n		"	"	428.6
56.83	1n		"	"	431.3
55.8	1n		"	"	436.5
55.20	1		"	"	439.5
54.62	1	48.14	"	"	442.4
51.23	1n		"	"	459.5
48.7	1n		"	"	472
48.00	2		"	"	475.8
45.13	1		"	"	490.3
43.30	1	41.21	"	"	499.6
42.05	1n		"	"	505.9
41.05	2		"	"	511.0
40.73	1		"	"	512.6
39.26	3	39.42	"	"	520.1
36.72	1	36.82	"	"	533.0
36.40	1	36.56	"	"	534.6
36.20	1	33.28	"	"	535.6
33.12	3		"	"	551.2

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4429.40	1		1.27	6.3	22570.1
28.8	1n		"	"	573
27.85	1	27.95	"	"	578.0
26.18	2n	26.27	"	"	586.4
25.30	1n		"	"	591.0
24.10	1		"	"	597.2
22.95	1		"	"	603.0
22.0	1n		"	"	608
21.8	1n		"	"	609
19.18	1		"	"	622.3
18.84	1	18.97 Ce?	"	"	624.1
16.40	2	16.48	"	"	636.6
14.8	1n	15.00	"	"	645
13.60	1		"	"	650.9
12.98	2	{ 13.02 12.90	"	"	654.1
12.68	1		"	"	655.6
11.80	1		"	"	660.2
10.60	2	10.73	"	"	666.4
09.10	1		"	"	674.1
08.61	1		"	"	676.6
06.65	1n		"	"	686.7
05.95	1n		"	"	690.3
02.98	1n		"	"	705.6
01.87	1		"	"	711.1
00.56	1		"	"	718.1
4399.25	2	4399.39 Ce?	"	"	724.8
98.10	2	98.16	"	"	730.8
96.67	1	96.69	"	"	738.2
95.09	2	95.14 Zr?	"	"	746.3
93.28	1	93.31	"	"	755.7
91.30	8	91.29	"	"	766.0
88.59	1		"	"	780.0
87.93	5	87.98	"	"	783.5
87.27	1		"	"	786.4
86.35	1		"	"	791.7
84.3	1n		"	"	802
82.10	8	82.03	"	"	813.8
81.56	1		"	"	816.3
80.13	1n		"	"	824.0
79.75	1n		"	"	826.1
79.00	1		"	"	830.0
77.50	2	77.50	"	"	837.8
75.77	1		"	"	846.8
74.96	2	74.98 Yt?	"	"	851.1
74.08	2	74.15	"	"	855.6
69.50	2	69.48	"	"	879.6
66.08	1		"	6.4	897.4
64.5	1n		"	"	906
62.55	1		"	"	916.0
61.96	1		"	"	919.1
61.50	2	61.52	"	"	921.5
59.00	1		"	"	934.6
58.70	1		"	"	936.2
57.79	1		"	"	941.0

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4355.50	2	55.54	1.27	6.4	22953.1
53.55	1	53.64 Ce ?	"	"	963.3
52.87	1	52.92 Ce ?	"	"	966.9
51.00	1		"	"	975.8
49.57	3n		"	"	984.4
47.36	1	47.46	"	"	996.0
45.22	1		"	"	23007.4
44.50	2	44.60	"	"	011.2
44.16	2	44.21	"	"	013.0
43.79	1	43.93	"	"	015.0
42.45	2	42.50 Zr ?	"	"	022.1
41.22	2	41.30 Zr ?	"	"	028.6
37.55	2	37.64	"	"	048.1
36.7	1n		"	"	053
35.89	3	35.97	"	"	056.9
35.46	1		"	"	059.2
34.11	2	34.22	"	"	066.4
32.09	2	32.18	"	"	076.5
31.4	1b		"	"	081
29.65	1	29.78 Zr ?	"	"	090.2
28.86	1	28.95	"	"	094.4
27.30	1		"	"	102.7
23.1	1n		"	"	125
22.9	1n		"	"	126
20.77	2	20.84	"	"	137.6
20.31	2	20.36	"	"	140.1
19.28	1	{ 19.82 19.42	"	"	147.6
18.47	1	18.61	"	"	150.0
16.15	1		"	"	162.4
15.86	1		"	"	164.0
15.52	1		"	"	165.8
14.22	1		"	"	172.8
13.53	1		"	"	176.5
13.17	1		"	"	178.4
10.90	1n		"	"	190.6
10.19	4	10.23	"	"	194.4
08.42	1		"	6.5	203.9
07.40	1		"	"	209.3
06.57	2	06.58	"	"	213.8
05.65	1n		"	"	218.8
02.2	1b	02.74 Ca ?	"	"	237
00.98	1		"	"	246.0
99.66	1		"	"	251.1
99.01	1	4298.79 Zr ?	"	"	254.7
97.53	1		"	"	262.7
97.11	1		"	"	265.0
96.83	1		"	"	266.5
95.25	3	95.27	"	"	275.0
91.60	1		"	"	294.8
90.6	1n		"	"	300
88.23	2	88.20	"	"	313.1
87.9	1n		"	"	315
86.90	1		"	"	320.4
86.38	1	86.39	"	"	323.2

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
4385.35	1n		1.27	6.5	23328.8
85.15	2	85.16	"	"	329.9
83.70	2	83.67	"	"	337.8
82.20	4	82.19	"	"	346.0
81.63	2	81.61	"	"	349.1
81.23	2	81.25	"	"	351.2
80.43	1		"	"	355.6
77.49	2	77.47	"	"	371.7
77.13	1	} 77.04	"	"	373.6
76.97	1		"	"	374.5
74.51	1		"	"	388.0
74.19	2	74.17 La?	"	"	389.7
73.54	3	73.51	"	"	393.3
71.26	1	71.26	"	"	405.7
70.49	1	70.50	"	"	410.0
63.50	1	63.54	"	"	448.4
62.9	1n		"	"	452
56.25	1	56.34 Ce?	"	"	488.3
54.60	1		"	"	497.5
54.09	1		"	"	500.3
54.00	1		"	"	500.8
53.66	1		"	6.6	502.6
53.35	1		"	"	504.3
50.50	2	50.57	"	"	520.1
49.80	2	49.91	"	"	523.9
48.10	3	48.23	"	"	533.3
47.73	1		"	"	535.4
4246.56	1		"	"	541.9
45.63	1		"	"	547.0
44.99	1		"	"	550.6
44.05	2	44.17	"	"	555.8
42.95	1n		"	"	561.9
42.52	1n	40.84 U?	"	"	564.3
39.13	1		"	"	583.1
37.25	1n		"	"	593.6
35.12	1		"	"	605.5
34.44	1		"	"	609.3
33.41	1	33.51	"	"	615.0
29.58	2	29.73	"	"	636.4
27.82	1	26.98 Ca?	"	"	646.3
26.0	1n		"	"	656
24.75	1		"	"	663.4
24.37	1		"	"	665.5
23.9	1n		"	"	668
22.32	1		"	"	676.6
20.23	2	20.27	"	"	688.8
19.54	1		"	"	692.7
18.69	1		"	"	697.4
18.34	1		"	"	699.4
17.35	1		"	"	705.0
16.19	1		"	"	711.5
14.73	1	15.74 Sr?	"	"	719.7
14.15	1		"	"	722.9
13.28	1		"	"	727.9
11.67	2	11.72	"	"	736.2



THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4209.01	5	09.07	1.27	6.6	23752.0
06.83	1	06.93	"	"	764.3
02.03	2	02.11	"	"	791.4
4199.18	1		"	6.7	807.5
97.24	1		"	"	818.5
96.02	2n	4195.97	"	"	825.4
95.75	2	95.73	"	"	826.9
94.27	1		"	"	835.3
93.15	1		"	"	841.7
92.03	1n	91.97 Zr?	"	"	848.1
88.75	1		"	"	866.8
84.95	1n	84.87	"	"	888.4
84.48	1	84.29	"	"	891.1
83.76	1	83.57	"	"	895.2
82.15	2	82.21	"	"	904.4
		81.18	"	"	
80.15	2		"	"	915.9
79.86	2	{ 79.98 Zr? 79.77	"	"	917.5
78.20	3	78.16	"	"	927.0
76.55	1n		"	"	936.5
74.65	1n		"	"	937.4
74.15	1n		"	"	940.3
73.7	1n		"	"	953
71.52	2	71.56	"	"	955.3
71.00	1	71.00	"	"	968.4
70.65	2	70.67	"	"	970.4
68.81	2	68.81	"	"	981.0
67.45	1n		"	"	988.8
66.7	1n		"	"	993
65.92	1		"	"	997.6
65.25	1	65.24	"	"	24001.4
64.43	1	64.45	"	"	006.2
63.84	2	63.86	"	"	009.8
63.37	1		"	"	012.3
62.87	2	62.88	"	"	015.2
62.10	1		"	"	019.6
61.73	1		"	"	021.2
60.9	1n		"	"	027
59.82	2	59.76	"	"	032.8
57.67	1		"	"	045.2
57.20	1		"	"	048.0
56.69	2	4156.67	"	"	050.9
56.35	1	56.39 Zr?	"	"	052.3
55.51	1		"	"	057.7
51.6	1		"	"	080
50.17	2	50.11 Ce?	"	"	088.7
48.5	1n		"	6.8	098
48.35	2	48.31	"	"	099.1
42.87	2	42.80	"	"	131.1
42.63	2	42.63 Ce?	"	"	132.5
41.82	3	41.75	"	"	137.2
40.42	4	40.35	"	"	145.4
38.97	1		"	"	153.8
36.53	2	36.51	"	"	168.0

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuum
			$\lambda +$	$\frac{1}{\lambda} -$	
4134.27	2	34.21	1.27	6.8	24131.3
32.95	3	32.91	"	"	189.0
31.60	2	31.63	"	"	196.9
30.83	1		"	"	201.4
30.15	ln		"	"	205.5
29.15	ln		"	"	211.2
27.60	1		"	"	220.4
24.79	2	24.76 Ce?	"	"	236.9
23.72	1	23.70	"	"	243.1
23.17	1		"	"	246.3
22.85	1	22.83	"	"	248.9
22.06	1	22.02	"	"	253.5
16.91	5	16.83	"	"	283.3
15.85	1		"	"	289.5
14.3	ln		"	"	299
13.77	1	13.71	"	"	299.8
12.95	1	12.92 Zr?	"	"	306.6
12.52	1	12.43	"	"	309.2
11.09	1	10.98	"	"	315.6
10.72	2	10.70	"	"	319.8
		10.31	"	"	
08.61	3	08.55	"	"	332.3
08.01	1	07.93	"	"	335.9
07.58	1	07.50 Ce?	"	"	338.4
06.6	ln	06.03	"	"	344
05.55	2	05.46	"	"	350.5
04.60	2	04.47	"	"	355.1
03.9	ln	03.75	"	"	359
		03.35	"	"	
01.60	1	00.97 Di?	"	"	373.9
01.08	2	00.50	"	"	376.0
00.57	1		"	"	380.0
4099.13	2	4099.05	"	6.9	388.5
97.93	1	97.85	"	"	395.7
97.52	1	97.45	"	"	398.1
94.99	3	94.90	"	"	413.2
93.60	ln	93.57	"	"	420.5
91.7	ln		"	"	433
91.53	1		"	"	433.8
86.71	3	86.88 La?	"	"	462.6
86.02	1	86.05 Zr?	"	"	463.7
85.22	4	85.21	"	"	471.6
83.60	1		"	"	481.3
82.49	1	82.43 Zr?	"	"	487.9
82.10	1	82.03 Zr?	"	"	490.3
81.23	1		"	"	495.5
80.50	1		"	"	499.9
80.12	1		"	"	502.2
79.77	1		"	"	504.3
79.35	1		"	"	506.8
		77.89 Sr?	"	"	
74.90	1		"	"	533.6
73.92	1		"	"	539.5
73.15	1	73.14	"	"	544.1
70.95	1		"	"	557.4

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4069.40	4	69.39	1.27	6.9	24566.7
68.15	1n		"	"	574.3
67.78	1		"	"	576.6
66.3	1n		"	"	585.5
65.90	1		"	"	587.9
65.46	1		"	"	590.6
64.9	1n		"	"	594
64.50	1		"	"	596.4
63.91	1		"	"	599.9
63.59	1		"	"	601.9
60.05	1		"	"	623.3
59.45	1		"	"	626.9
57.99	1		"	"	635.8
57.52	1		"	"	638.7
57.23	1n		"	"	640.4
55.43	1		"	"	651.4
55.00	1		"	"	654.0
53.68	1n		"	"	662.0
52.65	1n		"	"	668.3
51.3	1n		"	7.0	676
51.1	1n		"	"	678
50.02	1		"	"	684.1
49.02	3n	49.02	"	"	690.2
48.60	1	48.61	"	"	692.9
48.18	1	48.22	"	"	695.5
45.85	1		"	"	719.7
43.2	1n	43.21	"	"	726
41.36	2	41.32	"	"	737.1
40.45	1		"	"	742.7
39.53	1		"	"	748.9
37.40	1n		"	"	761.4
36.71	2	36.70	"	"	765.6
36.22	1		"	"	768.7
35.02	1		"	"	776.0
34.36	2		"	"	780.1
32.69	2	34.47	"	"	790.3
31.47	1n	32.74	"	"	797.8
31.25	1		"	"	799.2
31.00	1		"	"	800.7
30.45	1n		"	"	804.1
29.5	1n		"	"	810
29.18	1		"	"	811.9
28.83	1	28.94	"	"	814.1
27.82	1		"	"	820.4
27.48	1		"	"	822.4
26.30	1	26.42	"	"	829.7
25.78	2	25.85	"	"	832.9
24.63	1		"	"	841.0
23.70	1		"	"	845.5
23.25	1		"	"	848.5
22.23	1	22.30 Ce?	"	"	854.8
20.22	1		"	"	867.2
19.30	10		"	"	872.9
17.25	1		"	"	885.6
16.45	1		"	"	890.6

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4015.27	1n		1.27	7.0	24897.9
14.66	1		"	"	901.7
13.45	1		"	"	909.2
12.67	1		"	"	914.1
11.95	2		"	"	918.5
11.17	1		"	"	923.4
10.65	1n		"	"	926.6
09.70	1n		"	"	932.1
09.22	1		"	"	935.5
08.35	1		"	"	940.9
07.68	3		"	"	945.1
06.51	2		"	"	952.4
05.69	3		"	"	957.4
03.49	3		"	7.1	971.1
03.21	2		"	"	972.3
01.88	1		"	"	981.1
01.22	1		"	"	991.0
00.10	1		"	"	992.3
3998.01	3		"	"	999.7
97.60	1		"	"	25007.9
96.20	2		"	"	016.7
94.70	2		"	"	026.1
93.86	1		"	"	031.3
92.46	1		"	"	040.1
92.21	1		"	"	041.7
91.80	1n		"	"	044.3
90.72	1n		"	"	051.0
90.25	1		"	"	054.0
88.99	1		"	"	061.9
88.71	1		"	"	063.5
88.17	3		"	"	067.0
87.88	1		"	"	068.9
87.35	1		"	"	072.2
87.21	1		"	"	072.6
86.81	1		"	"	075.6
86.26	1		"	"	079.0
85.55	1		"	"	083.5
84.76	1		"	"	088.5
84.50	1		"	"	090.2
82.36	1		"	"	103.6
82.23	1		"	"	104.0
81.70	1		"	"	107.8
81.28	3		"	"	110.5
80.90	2		"	"	112.9
80.26	1		"	"	116.9
79.20	2		"	"	123.6
77.99	1		"	"	131.2
76.56	2		"	"	140.3
75.36	1		"	"	147.9
74.38	1		"	"	154.0
72.30	1		"	"	167.2
70.00	1		"	"	181.8
69.70	1n		"	"	183.7
69.50	1		"	"	185.0
69.15	1		"	"	187.2



THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3967.52	1n		1.27	7.1	25197.6
67.37	1		"	"	198.5
67.10	1		"	"	200.2
66.9	1n		"	"	201.5
65.00	1		"	"	212.6
63.65	2		"	"	222.2
63.33	2		"	"	224.2
62.49	2		"	"	229.5
61.07	1		"	"	238.6
60.50	2		"	"	242.2
59.38	1n		"	"	249.4
58.30	1		"	"	256.3
56.75	3		"	"	266.2
55.38	1n		"	7.2	274.8
53.58	1n		"	"	287.3
52.60	1		"	"	292.6
51.66	3		"	"	298.6
51.25	1		"	"	301.2
50.53	2		"	"	305.9
49.06	2r		"	"	315.3
47.80	1n		"	"	327.4
47.48	1n		"	"	325.4
47.3	1n		"	"	327
46.30	2		"	"	333.0
45.96	1		"	"	335.2
45.63	2		"	"	337.3
43.81	2		"	"	349.0
43.47	2n		"	"	351.2
42.95	1n		"	"	354.5
42.75	1		"	"	355.7
42.20	1		"	"	359.3
41.48	1		"	"	364.0
40.49	1		"	"	370.4
39.88	1		"	"	374.3
38.86	2		"	"	370.9
38.01	2		"	"	386.3
37.14	2		"	"	391.9
36.45	1		"	"	396.4
36.07	1		"	"	398.8
35.74	1		"	"	401.0
35.32	1		"	"	403.7
34.90	1		"	"	406.4
33.65	1		"	"	414.5
33.00	1		"	"	418.7
32.35	1		"	"	422.9
32.10	1		"	"	424.5
31.35	1n		"	"	429.6
30.43	1		"	"	435.3
29.74	3		"	"	439.8
27.54	2		"	"	454.0
27.24	2		"	"	456.0
26.80	1		"	"	458.8
25.19	2n		"	"	469.3
22.34	1		"	"	487.8
20.41	1		"	"	500.3

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3918.62	1		1.27	7.2	25111.4
18.13	1		"	"	515.2
16.90	3		"	"	523.2
15.92	1		"	"	529.6
14.6	1n		"	"	538
13.95	1		"	"	542.4
13.15	2		"	"	547.6
12.41	2		"	"	553.5
11.45	1		"	"	558.3
08.6	1n		"	7.3	577
08.03	1		"	"	581.0
07.48	1n		"	"	584.7
06.95	1n		"	"	588.1
06.13	1n		"	"	593.5
05.29	3r		"	"	599.0
04.21	2		"	"	606.1
02.60	1		"	"	616.6
02.25	1		"	"	618.9
01.3	1n		"	"	625
00.99	3		"	"	627.2
00.25	1		"	"	631.6
3899.1	1n		"	"	640
98.95	1		"	"	640.6
98.60	1		"	"	642.9
95.55	1		"	"	663.0
95.02	1		"	"	666.5
94.53	1		"	"	669.7
93.55	1		"	"	676.2
93.20	2		"	"	678.5
92.42	2		"	"	683.7
91.18	2		"	"	691.9
90.49	1		"	"	696.4
87.55	1		"	"	715.8
87.08	1		"	"	719.0
86.12	1		"	"	723.3
85.87	1n		"	"	727.0
84.96	2		"	"	733.0
84.67	1		"	"	734.9
72.87	3 CN		"	"	813.3
72.45	1n		"	"	816.1
69.77	1		"	"	834.0
69.50	1		"	"	835.8
67.46	1		"	"	849.4
67.00	1n		"	"	852.5
65.20	1*		"	"	864.6
63.51	3 CN		"	"	875.9
62.50	1		"	"	882.7
59.98	3n		"	"	899.6
54.61	3		"	"	935.7
53.60	1		"	"	942.5
53.10	1		"	"	945.8
51.72	1n		"	"	959.1
46.40	1		"	"	991.0
45.17	1		"	"	999.3
43.10	3		"	"	26013.3

\* Double.

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3839.90	3		1.27	7.3	26035.0
38.92	1		"	"	041.7
38.01	2		"	"	047.9
36.65	2 CN		"	"	057.1
34.75	1		"	"	070.0
32.97	1		"	"	082.1
32.59	1		"	"	084.7
31.90	3		"	"	089.4
29.53	2		"	"	105.6
28.58	2 CN		"	"	112.0
28.30	2 CN		"	"	114.0
27.11	2		"	"	132.1
25.80	1		"	"	131.0
25.21	2		"	"	135.0
24.92	1		"	"	137.0
24.52	1		"	"	139.8
23.74	1		"	"	145.1
23.50	1		"	"	146.7
22.33	3		"	"	154.7
21.94	1		"	"	157.4
21.57	3		"	"	159.9
20.95	1		"	"	164.2
20.13	1n		"	"	169.8
19.46	2n		"	"	174.4
19.2	1n		"	"	176
18.81	1		"	"	178.9
17.86	2n		"	7.4	185.3
17.51	2		"	"	187.7
16.73	1		"	"	193.0
15.71	1		"	"	199.0
15.22	1		"	"	203.4
15.02	1		"	"	204.7
14.73	2		"	"	206.8
13.85	1		"	"	212.8
13.21	4		"	"	217.2
12.30	2		"	"	223.5
11.55	2		"	"	228.6
11.20	1		"	"	231.1
10.75	1n		"	"	234.2
10.00	3		"	"	239.3
09.25	1		"	"	244.5
08.84	1n		"	"	247.3
08.30	1n		"	"	251.0
08.04	3		"	"	252.8
06.96	1		"	"	260.3
05.95	2		"	"	267.2
05.55	1		"	"	270.0
05.18	1		"	"	272.5
04.85	2		"	"	274.8
04.3	1n		"	"	279
04.2	1n		"	"	279
03.25	2		"	"	283.8
02.93	1		"	"	288.0
02.31	1		"	"	292.3
02.10	1		"	"	293.8

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3801.75	1n		1.27	7.4	26296.4
01.50	2		"	"	298.0
00.80	2		"	"	301.9
00.53	1		"	"	304.8
00.20	1		"	"	307.0
3799.79	1		"	"	309.8
99.36	1		"	"	312.8
98.70	1n Fe		"	"	317.4
98.25	1n		"	"	320.5
98.1	1n		"	"	321
97.66	2		"	"	324.6
97.10	1		"	"	328.5
96.33	1		"	"	333.8
95.90	1		"	"	336.8
95.53	2		"	"	339.4
94.50	2		"	"	346.5
94.30	2		"	"	347.9
93.92	1		"	"	350.6
93.65	1		"	"	352.4
93.14	1		"	"	353.5
92.80	1		"	"	358.35
92.52	1		"	"	360.3
92.15	1n		"	"	362.9
91.50	2		"	"	367.4
90.99	1		"	"	370.9
90.67	1		"	"	373.1
90.2	2n		"	"	378
89.29	3		"	"	382.8
88.54	1		"	"	387.0
87.65	1		"	"	394.0
87.34	1		"	"	396.4
87.04	1		"	"	402.3
86.12	1		"	"	405.1
85.80	3		"	"	407.1
85.50	1n		"	"	409.2
83.95	2b		"	"	420.0
83.48	2		"	"	423.3
83.27	3		"	"	424.8
82.35	1n		"	"	431.2
81.83	1		"	"	434.8
81.05	1n		"	"	440.3
80.65	1		"	"	443.1
79.95	1		"	"	448.0
78.93	1		"	"	455.1
78.06	1		"	"	461.2
77.50	1		"	"	465.1
77.27	1		"	"	466.7
76.10	2r		"	"	474.9
75.47	1		"	"	479.4
74.40	2n		"	"	486.9
73.94	3		"	"	490.1
73.23	2n		"	"	495.0
72.41	2		"	7.5	500.7
71.96	1		"	"	503.9
71.55	1		"	"	506.8



THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3770.4	1n		1.27	7.5	26515
70.25	1n		"	"	515.9
68.62	1		"	"	527.4
68.05	3		"	"	531.4
67.39	1		"	"	536.2
66.52	1n		"	"	542.2
65.70	1		"	"	548.0
65.43	2		"	"	549.9
64.9	1n		"	"	554
64.48	1		"	"	556.6
64.26	1		"	"	558.1
63.75	1		"	"	561.7
63.49	1		"	"	563.7
63.04	4		"	"	566.7
62.50	1n		"	"	570.6
61.28	3n		"	"	579.2
60.48	2		"	"	584.9
59.46	2		"	"	592.1
58.95	1		"	"	595.8
57.88	1		"	"	603.2
57.44	1		"	"	606.4
56.9	1n		"	"	610
56.46	1		"	"	613.3
56.05	1n		"	"	616.2
55.55	1n		"	"	619.7
55.37	1n		"	"	621.0
54.75	2		"	"	625.4
52.73	6		"	"	639.8
51.91	1		"	"	645.6
50.82	1		"	"	653.3
50.30	1		"	"	657.0
49.17	1		"	"	665.1
48.45	2		"	"	670.2
47.73	3		"	"	675.3
46.68	1		"	"	682.8
46.15	3		"	"	686.5
44.89	2		"	"	695.6
43.71	2		"	"	704.0
43.15	1		"	"	708.0
42.45	1		"	"	712.9
41.40	6		"	"	720.5
41.03	2		"	"	723.1
40.6	1n		"	"	726
39.95	1		"	"	730.8
39.02	4		"	"	737.5
37.37	1		"	"	749.3
37.10	1		"	"	751.2
35.70	1		"	"	761.2
35.05	1 Fe?		"	"	765.9
34.77	2		"	"	767.9
32.85	1n		"	"	781.7
31.60	2		"	"	790.6
30.96	4		"	"	795.3
28.32	1		"	7.6	814.1
28.11	1		"	"	815.6

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3726.89	3		1.27	7.6	26824.5
26.40	1n		"	"	827.9
26.02	1		"	"	830.7
24.93	2		"	"	838.5
24.70	1		"	"	840.2
23.85	2		"	"	846.3
23.46	2		"	"	849.1
22.35	3		"	"	857.1
22.01	3		"	"	859.6
21.55	1n		"	"	862.9
20.90	1n		"	"	867.6
20.52	3		"	"	870.4
20.18	3		"	"	872.8
19.90	1		"	"	874.8
19.63	1		"	"	876.8
18.85	1		"	"	882.4
18.36	2		"	"	886.0
18.00	2		"	"	888.4
16.98	1		"	"	896.0
16.42	1		"	"	900.0
14.53	1n		"	"	913.7
12.71	2		"	"	926.9
11.95	1n		"	"	932.4
11.50	3		"	"	935.7
10.75	1		"	"	941.1
09.82	1		"	"	947.9
08.90	2		"	"	954.6
07.60	1		"	"	964.0
07.16	1		"	"	967.2
06.91	2		"	"	976.8
06.15	1n		"	"	975.6
05.16	1		"	"	981.8
04.16	4		"	"	989.0
03.04	2		"	"	997.2
02.26	1		"	"	27002.9
00.95	3		"	"	012.5
00.50	2n		"	"	015.8
00.1	1n		"	"	019
3698.95	1		"	"	027.1
98.47	2		"	"	030.6
98.30	1n		"	"	031.8
97.21	2		"	"	039.8
96.82	2		"	"	042.7
96.15	3		"	"	047.6
95.25	1n		"	"	054.2
95.05	1n		"	"	055.6
94.08	3		"	"	062.8
92.65	6r		"	"	073.2
92.24	1		"	"	077.3
90.67	3		"	"	087.7
90.27	2		"	"	090.6
88.93	4		"	"	100.5
88.40	1		"	"	104.3
87.80	2n		"	"	108.8
87.13	1		"	"	113.7

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3686.03	1		1.27	7.6	27121.8
84.10	1		"	"	136.1
83.50	1		"	7.7	140.8
83.01	1		"	"	144.0
82.52	1		"	"	147.6
82.06	2		"	"	151.0
81.38	2		"	"	156.0
80.72	1		"	"	160.9
79.89	5		"	"	167.0
78.96	1		"	"	173.9
78.19	4		"	"	179.6
78.0	1n		"	"	181
76.88	1		"	"	189.3
75.72	4		"	"	197.9
73.97	3		"	"	210.8
73.45	2		"	"	214.6
73.15	1		"	"	216.9
71.72	1 M ?		"	"	227.5
71.38	1		"	"	230.0
70.80	1		"	"	234.3
70.21	3		"	"	238.7
69.56	1		"	"	243.5
68.31	1		"	"	252.8
66.53	1		"	"	266.0
65.90	1		"	"	270.7
65.62	1		"	"	272.8
65.33	1		"	"	275.0
63.88	4		"	"	285.8
63.32	2		"	"	289.9
62.80	1		"	"	293.8
62.36	1		"	"	297.1
61.65	6n		"	"	302.4
60.28	1		"	"	312.6
59.66	6n		"	"	317.2
58.32	2n		"	"	327.2
58.20	3		"	"	328.1
57.70	1		"	"	331.9
56.35	2		"	"	341.9
55.2	1n		"	"	351
54.74	1		"	"	354.0
53.72	1		"	"	361.7
52.69	2		"	"	369.4
52.31	4		"	"	372.2
51.72	1		"	"	376.7
23.17	1		"	7.8	592.3
22.87	1		"	"	594.6
22.45	1		"	"	597.8
21.25	4		"	"	606.9
20.52	3		"	"	615.2
19.85	1		"	"	617.9
19.50	1		"	"	620.3
18.87	1n		"	"	625.1
18.48	1n		"	"	628.1
17.88	1		"	"	632.7
17.22	5		"	"	637.7

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3616.85	1		1.27	7.8	27641.6
15.26	3		"	"	652.7
14.16	3		"	"	661.1
13.91	1		"	"	663.1
12.57	1		"	"	673.3
12.27	1		"	"	675.6
10.94	2		"	"	685.3
10.55	2		"	"	688.8
10.20	2 <sub>n</sub>		"	"	691.5
09.60	4		"	"	696.1
09.34	1		"	"	698.1
08.48	1		"	"	704.7
08.07	1		"	"	707.9
07.52	1		"	"	712.1
06.87	1 <sub>n</sub>		"	"	717.1
06.32	2		"	"	721.3
05.78	1		"	"	725.4
04.17	2		"	"	737.8
03.76	1		"	"	741.0
03.49	2		"	"	743.1
03.32	3		"	"	744.4
02.63	1 <sub>n</sub>		"	"	749.7
02.14	1		"	"	753.5
01.20	7		"	"	760.7
3599.77	1		"	"	771.7
99.45	1		"	"	774.2
99.13	1		"	"	777.7
98.24	1 <sub>n</sub>		"	"	783.5
97.00	1		"	"	793.1
95.40	2		"	"	805.5
94.20	1 <sub>n</sub>		"	7.9	814.7
93.96	2		"	"	816.6
92.92	2		"	"	824.6
92.60	1		"	"	827.2
91.16	3 <sub>n</sub>		"	"	838.2
89.47	2		"	"	851.4
89.22	1		"	"	853.3
88.35	2		"	"	860.0
85.91	2		"	"	879.0
85.16	2		"	"	884.9
83.16	2		"	"	899.6
82.15	2		"	"	907.5
81.33	1		"	"	914.7
80.36	2		"	"	922.2
79.45	3		"	"	929.3
78.27	1		"	"	938.5
77.34	1		"	"	941.8
76.68	1		"	"	951.0
75.43	4		"	"	960.7
73.64	1		"	"	974.7
73.35	2		"	"	977.0
72.52	4		"	"	983.5
71.70	2		"	"	990.0
70.03	1		"	"	28003.1
69.75	1		"	"	005.3



THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3568.10	1		1.27	7.9	28018.2
67.81	1		"	"	020.5
67.40	1		"	"	023.7
67.16	1		"	"	025.6
66.3	1b		"	"	032
65.24	1		"	"	040.7
64.83	2		"	"	043.9
64.1	2b		"	"	050
63.48	1		"	"	054.5
60.99	1		"	"	074.2
60.08	2		"	"	081.4
59.55	3		"	"	085.5
57.56	2		"	"	101.2
56.45	1		"	"	110.0
55.9	1b		"	"	114
55.21	2		"	"	119.9
54.45	1		"	"	125.9
53.52	1n		"	"	133.2
53.23	2		"	"	135.5
52.03	1		"	"	145.0
51.55	1		"	8.0	148.7
50.89	1		"	"	154.0
50.47	2		"	"	157.3
49.91	2		"	"	161.7
47.60	1		"	"	180.1
46.41	1		"	"	189.5
45.48	3n*		"	"	196.9
45.19	1		"	"	199.2
44.55	1n		"	"	204.3
44.2	1n		"	"	207
42.80	1		"	"	218.2
42.40	1		"	"	221.4
42.14	1		"	"	223.5
41.80	2		"	"	226.2
39.75	3		"	"	242.6
39.47	2		"	"	244.8
38.90	10		"	"	249.4
38.37	1		"	"	253.6
37.30	3		"	"	262.1
36.80	1		"	"	266.1
36.2	1n		"	"	271
35.5	1b		"	"	276.5
33.85	1		"	"	288.7
33.12	1n		"	"	295.6
32.08	2		"	"	303.9
31.8	1n		"	"	306
29.06	5		"	"	328.2
28.3	1b		"	"	334
27.5	1b		"	"	341
26.89	1		"	"	345.6
26.40	1		"	"	349.5
25.80	1		"	"	354.4
25.30	1		"	"	358.4
23.73	1		"	"	371.0
22.09	3		"	"	384.2

\* Double.

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3520·85	1		1·27	8·0	28394·2
19·88	2		"	"	402·1
19·02	1		"	"	409·0
18·83	1		"	"	410·5
16·96	3		"	"	425·6
16·50	2		"	8·1	429·2
15·89	1		"	"	434·2
15·13	1		"	"	440·3
14·70	2		"	"	443·8
13·90	1		"	"	450·3
13·41	1		"	"	454·3
12·29	2		"	"	463·3
11·82	6r		"	"	467·2
10·91	1		"	"	474·5
10·72	1		"	"	476·1
09·33	1		"	"	487·3
07·72	10		"	"	498·2
07·00	1		"	"	500·7
05·62	2		"	"	517·7
04·20	1		"	"	529·1
03·75	2		"	"	532·7
02·94	2		"	"	539·3
02·13	1		"	"	545·9
01·61	2		"	"	550·2
01·03	1		"	"	554·9
00·70	1		"	"	557·6
00·45	1		"	"	559·7
00·15	2		"	"	562·1
3499·15	2		"	"	570·3
98·77	1		"	"	573·4
98·15	2		"	"	579·4
97·85	1		"	"	580·9
97·41	1		"	"	584·5
97·19	1		"	"	586·3
96·94	1		"	"	588·3
95·90	1		"	"	596·8
93·69	2		"	"	614·9
93·47	1		"	"	616·7
92·85	1		"	"	621·8
91·75	1		"	"	630·8
90·62	2		"	"	639·3
90·42	1		"	"	641·7
89·99	1		"	"	645·3
88·00	2		"	"	661·6
87·15	2n		"	"	668·6
86·67	3		"	"	672·6
85·63	1n		"	"	681·1
85·35	2		"	"	683·4
84·25	1		"	"	692·4
83·56	1n		"	"	698·2
83·36	2		"	"	699·8
82·96	2*		"	"	703·9
82·70	2		"	"	705·3
81·20	1		"	"	717·6
79·33	2		"	"	733·0

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3479.25	1		1.27	8.1	28733.7
78.60	2		"	"	739.1
78.28	2		"	"	741.7
77.84	2		"	"	745.4
77.06	1		"	"	751.8
76.70	2		"	"	754.8
76.13	1		"	"	759.5
75.71	1		"	"	763.0
74.46	1		"	"	773.3
73.97	1		"	"	777.4
73.59	2		"	"	780.5
73.21	2		"	"	783.7
70.08	5r		"	"	809.6
69.50	1		"	"	814.4
68.83	1		"	"	820.0
68.36	3		"	"	823.8
68.07	1		"	"	826.3
67.05	1		"	"	834.8
65.88	4r		"	"	844.5
65.17	1		"	"	850.4
64.58	1 Sr ?		"	"	855.3
63.86	3		"	"	861.3
63.00	4r		"	"	868.5
61.37	1		"	"	882.1
61.20	1		"	"	883.5
59.75	1		"	"	895.6
59.69	1		"	"	896.1
58.06	1		"	"	909.8
57.80	1		"	"	911.9
57.08	1		"	"	917.9
56.57	1		"	"	920.5
56.10	1		"	8.2	926.2
55.40	1		"	"	932.0
55.1	1n		"	"	934.5
54.83	1		"	"	936.8
54.35	2		"	"	942.8
54.05	1		"	"	949.3
53.68	1		"	"	946.4
52.81	2		"	"	953.7
51.85	1		"	"	961.8
51.13	2		"	"	967.8
50.9	1n		"	"	970
50.0	1n		"	"	977
49.77	2		"	"	979.2
49.42	2		"	"	982.2
48.9	1n		"	"	986.5
47.75	1		"	"	996.2
46.68	1		"	"	29005.2
45.87	2		"	"	012.0
45.50	1		"	"	015.2
45.34	2		"	"	016.5
44.15	1		"	"	026.5
43.25	1		"	"	029.9
41.49	2		"	"	049.0
41.16	2		"	"	051.8

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuum
			$\lambda +$	$\frac{1}{\lambda}$	
3439.83	4		1.27	8.2	29063.0
39.07	3		"	"	069.5
37.13	1		"	"	085.9
36.80	2		"	"	088.6
36.05	3r		"	"	095.0
34.86	2		"	"	105.1
34.09	4		"	8.3	111.6
31.95	2		"	"	129.7
31.16	1		"	"	136.4
30.70	1		"	"	140.3
30.50	1		"	"	142.0
29.99	2		"	"	146.4
29.47	2		"	"	150.7
29.10	1		"	"	153.8
28.09	1		"	"	162.4
27.58	1		"	"	165.8
27.1	1n		"	"	171
26.20	1n		"	"	178.5
26.04	1		"	"	179.9
25.28	2		"	"	186.4
24.09	1		"	"	196.6
23.24	2		"	"	203.8
22.70	1		"	"	208.4
21.31	2		"	"	220.3
19.29	3		"	"	237.5
18.99	2		"	"	240.1
18.89	2		"	"	241.0
17.83	1		"	"	250.0
17.22	1		"	"	255.4
16.54	1		"	"	261.2
16.03	1		"	"	265.5
15.2	1b		"	"	273
14.59	2		"	"	277.8
13.52	1		"	"	287.0
13.15	1		"	"	290.2
12.53	1n		"	"	295.5
11.92	2		"	"	300.7
11.50	1		"	"	304.3
09.37	2		"	"	322.6
08.76	2		"	"	327.9
07.76	1		"	"	336.5
06.84	1		"	"	344.4
05.70	1		"	"	354.2
04.75	2		"	"	362.4
03.42	2		"	"	373.9
02.81	4		"	"	379.2
02.16	2		"	"	384.8
01.78	2		"	"	388.1
01.17	1n		"	"	393.4
3398.70	1		"	"	414.7
98.02	1		"	"	421.6
97.65	1		"	8.4	423.7
97.23	1		"	"	427.4
96.7	1n		"	"	432
96.53	1		"	"	433.4



THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3395.77	1		1.27	8.4	29440.0
95.50	1		"	"	442.3
95.26	1		"	"	444.4
94.96	1		"	"	447.0
94.64	1		"	"	449.8
94.27	1		"	"	452.9
93.35	1		"	"	461.0
93.05	1		"	"	463.6
92.20	5		"	"	471.0
91.85	1		"	"	474.0
90.93	1		"	"	482.0
90.48	1		"	"	485.9
89.77	3		"	"	492.1
88.70	2		"	"	501.4
86.64	3		"	"	519.4
85.66	3		"	"	527.9
85.16	1		"	"	532.3
83.27	3		"	"	548.8
83.02	1 Ag		"	"	551.0
81.51	2		"	"	564.2
79.9	2b		"	"	578
79.28	1		"	"	583.7
78.70	3		"	"	588.8
77.57	8		"	"	598.7
76.98	1		"	"	603.9
75.15	1		"	"	619.9
74.73	3		"	"	623.6
72.85	1		"	"	640.2
71.96	3		"	"	647.9
71.65	1		"	"	650.7
70.95	1		"	"	656.8
70.53	1		"	"	660.5
69.23	1n		"	"	671.1
67.93	3		"	"	683.4
66.8	1n		"	"	693
66.64	2		"	"	694.8
65.75	1n		"	"	702.7
65.43	1 Cu?		"	"	705.5
64.79	2		"	"	711.1
63.84	2		"	"	719.5
63.20	1		"	"	725.1
62.80	1		"	"	728.7
62.68	1		"	"	729.7
62.35	1		"	"	732.7
61.82	3		"	"	737.4
60.51	2		"	8.5	748.1
60.30	1		"	"	750.7
59.87	1		"	"	754.7
59.20	1		"	"	760.4
58.74	3		"	"	764.6
57.48	1		"	"	775.7
57.38	1		"	"	776.6
57.21	1		"	"	778.1
56.96	1		"	"	780.4
55.96	2		"	"	789.2

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)--*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3355.38	2		1.27	8.5	29794.4
54.74	2		"	"	800.0
54.35	3		"	"	803.5
54.10	1		"	"	805.8
53.31	1		"	"	812.8
51.75	1		"	"	826.7
51.38	4		"	"	830.0
50.43	1		"	"	838.4
49.99	1		"	"	842.3
49.48	1		"	"	846.9
49.10	2		"	"	850.3
47.72	1		"	"	862.6
46.68	2		"	"	871.9
45.01	2r		"	"	886.8
44.46	1		"	"	891.7
43.77	2r		"	"	898.4
43.41	1		"	"	901.1
42.37	1n		"	"	910.4
39.70	6		"	"	934.3
38.50	1		"	"	945.1
38.00	3		"	"	949.6
37.65	1		"	"	952.7
37.26	1		"	"	956.2
36.9	1n Mg?		"	"	959
36.26	1n		"	"	965.2
35.17	1		"	"	974.9
34.72	4		"	"	979.0
34.18	1n		"	"	983.9
33.50	1n		"	"	990.0
32.56	1		"	"	998.4
32.22	1		"	"	30001.5
31.30	1		"	"	009.8
30.62	1		"	"	015.9
28.40	1n		"	"	036.0
27.86	1n		"	"	040.8
27.32	1		"	"	045.7
26.58	1		"	"	052.4
25.27	4r		"	"	064.2
24.88	2		"	8.6	067.7
22.60	1		"	"	088.3
21.57	3		"	"	097.6
20.97	3n		"	"	103.1
20.42	2		"	"	108.1
19.76	1		"	"	114.1
19.09	1		"	"	120.1
18.35	1n		"	"	126.9
17.90	1		"	"	131.0
17.7	1n		"	"	133
16.37	1		"	"	144.8
14.99	2		"	"	157.4
13.87	10		"	"	167.6
12.23	1		"	"	182.5
10.65	1n		"	"	196.8
10.35	2		"	"	199.7
09.25	1		"	"	209.7

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3308.20	1		1.27	8.6	30219.3
04.33	1		"	"	254.7
03.59	1		"	"	261.5
01.81	1*		"	"	277.8
01.44	2		"	"	281.2
00.63	12		"	"	288.6
3299.80	1		"	"	296.3
97.95	2		"	"	314.2
97.47	1		"	"	317.7
96.72	2		"	"	324.6
95.65	1		"	"	334.4
95.44	1		"	"	336.4
95.12	1		"	"	339.3
94.76	1		"	"	342.8
94.67	1		"	"	343.4
94.37	1		"	"	346.2
94.06	2		"	"	349.1
93.79	1		"	"	351.6
93.71	1		"	"	352.3
92.62	3		0.92	"	361.9
91.88	3		"	"	369.2
91.50	1		"	"	372.7
90.73	10		"	"	379.8
90.25	1		"	8.7	384.2
88.27	1		"	"	402.4
87.90	2		"	"	406.8
86.71	2		"	"	416.9
84.23	2n		"	"	439.8
83.11	2		"	"	450.2
82.75	2		"	"	453.6
82.2	1b		"	"	459
81.56	1		"	"	464.6
81.42	1		"	"	465.9
80.84	1		"	"	471.3
80.52	2		"	"	474.3
78.90	1		"	"	489.3
76.30	1		"	"	513.5
75.20	2r		"	"	523.8
74.55	1		"	"	529.8
72.5	16		"	"	549
71.3	1n		"	"	560
70.97	1		"	"	563.3
70.37	1		"	"	568.8
69.57	1		"	"	576.3
67.65	2		"	"	594.3
66.45	1		"	"	605.6
65.67	1		"	"	612.9
64.56	1		"	"	623.3
64.26	1		"	"	626.1
63.8	1n		"	"	630
63.16	1		"	"	636.4
62.79	3		"	"	639.9
61.66	1		"	"	650.5
61.2	1n		"	"	655
61.04	1		"	"	656.4

\* Double.

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3259.82	1		0.92	8.7	30667.8
59.35	1		"	"	672.3
58.2	1n		0.91	"	683
58.05	1		"	"	684.7
57.27	2		"	"	691.9
56.38	3		"	"	700.2
55.62	2		"	"	707.4
54.96	1		"	"	718.7
53.12	1		"	"	731.0
52.85	1		"	8.8	733.5
52.02	1		"	"	741.3
50.3	1n		"	"	757.5
50.06	1		"	"	759.9
49.02	1		"	"	769.7
48.62	2n		"	"	773.5
46.73	1		"	"	791.4
45.91	3		"	"	799.2
44.64	1		"	"	811.1
43.96	1		"	"	817.8
43.18	1		"	"	825.2
42.42	2n		"	"	832.4
41.70	1		"	"	839.2
41.25	3		"	"	843.5
40.62	2n		"	"	849.5
39.38	1		"	"	861.3
38.91	1		"	"	865.8
38.23	3		"	"	872.3
37.36	1n		"	"	890.1
35.95	2		"	"	894.0
35.00	1		"	"	903.1
33.70	1		"	"	915.5
33.48	1		"	"	917.6
32.87	1		"	"	923.5
32.21	7		"	"	928.8
30.98	2		"	"	951.6
29.10	3		"	"	959.6
27.90	2		"	"	971.1
27.10	1		"	"	978.9
26.52	1		"	"	984.3
26.23	1		"	"	986.2
25.80	1		"	"	991.3
25.51	2		"	"	994.0
24.55	1		"	"	31003.3
23.93	1		"	"	009.2
23.40	1		"	"	014.3
22.00	1		"	"	027.8
21.40	12		"	"	033.6
20.46	1		"	"	038.1
18.94	1		"	"	057.3
18.45	1		"	"	062.0
17.94	1		"	"	067.0
17.56	1		"	"	070.6
16.71	8		"	"	078.8
15.92	1		"	8.9	086.4
13.71	2		"	"	107.8



THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3212.96	ln		0.91	8.9	31115.0
12.17	ln		"	"	122.6
10.43	2		"	"	139.5
09.47	ln		"	"	148.9
08.15	1		"	"	161.7
07.88	1		"	"	164.3
07.03	1		"	"	172.6
06.30	1		"	"	179.7
05.45	ln		"	"	188.0
04.02	1		"	"	201.9
03.75	1		"	"	204.5
03.36	1		"	"	208.3
02.25	1		"	"	219.1
3199.09	1		"	"	250.0
98.83	1		"	"	252.5
98.60	1		"	"	254.8
98.34	1		"	"	267.3
97.73	ln		"	"	273.3
95.90	1		"	"	279.2
95.45	1		"	"	285.6
93.50	1		"	"	304.7
93.29	1		"	"	306.7
92.25	1		"	"	316.9
91.98	1		"	"	319.6
91.33	1*		"	"	326.0
90.86	1		"	"	330.6
90.25	2*		"	"	336.6
88.38	5		"	"	355.0
87.56	1		"	"	364.0
87.14	1		"	"	367.1
85.05	2		"	"	387.7
84.06	ln		"	"	397.5
83.94	1		"	"	398.7
83.70	1		"	"	401.1
82.80	1		"	"	409.9
82.52	1		"	"	412.7
81.9	ln		"	"	419
81.33	1		"	"	424.5
80.35	4		"	9.0	434.0
79.18	2		"	"	445.6
78.91	1		"	"	448.3
78.00	1		"	"	457.3
77.65	1		"	"	460.8
77.33	1		"	"	463.9
76.65	1		"	"	470.7
75.84	3		"	"	478.7
74.62	1		"	"	490.8
74.34	1		"	"	493.6
73.3	lb		"	"	504
72.65	1		"	"	510.4
72.24	1		"	"	514.5
71.84	1		"	"	518.4
70.53	1		"	"	531.5
69.98	ln		"	"	538.9
69.43	1		"	"	542.4

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuum
			$\lambda +$	$\frac{1}{\lambda} -$	
3167.66	1		0.91	9.0	31560.0
66.63	1n		"	"	570.0
66.25	1		"	"	574.1
65.94	1		"	"	577.2
65.8	1n		"	"	579
64.60	1		"	"	590.6
62.95	1		"	"	607.0
62.9	1b		"	"	611.5
61.81	1		"	"	618.4
60.95	1n		"	"	627.1
60.3	1n		"	"	634
59.20	1		"	"	644.6
58.72	1		"	"	649.4
58.02	1		"	"	656.4
56.49	1		"	"	671.7
55.93	1		"	"	677.4
54.89	3		"	"	687.8
54.40	2		"	"	692.7
51.9	1n		"	"	718
51.75	1		"	"	719.4
50.56	2		"	"	731.4
50.08	1		"	"	736.1
48.11	5		"	"	756.1
46.15	2		"	9.1	765.7
42.95	2r		"	"	808.2
42.41	3n		"	"	813.6
41.95	2		"	"	818.3
41.03	1		"	"	827.6
39.38	3		"	"	844.3
37.25	1n		"	"	864.9
36.83	1		"	"	870.2
34.50	2		"	"	893.9
33.70	1		"	"	902.1
31.17	1 Be?		"	"	927.8
30.08	1		"	"	939.0
27.26	1		"	"	967.9
25.60	3		"	"	984.7
25.27	2		"	"	988.2
24.47	3		"	"	996.4
23.05	3		"	"	32011.1
22.5	1b		"	"	016.5
21.1	1n		"	"	031
19.60	3		"	"	046.3
17.75	2		"	"	065.3
16.56	1		"	"	074.2
16.4	1n		"	"	078
16.9	1n		"	"	079
14.1	1b		"	"	103
12.46	4		"	"	119.7
11.9	1n		"	"	125.5
10.92	2		"	"	135.6
08.37	3		"	"	162.0
07.11	2		"	"	175.0
06.76	1		"	"	168.7
05.83			"	"	188.3

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuum
			$\lambda +$	$\frac{1}{\lambda} -$	
3105.12	1		0.91	9.1	32195.7
04.50	1		"	"	202.1
02.76	1		"	"	220.2
01.80	1		"	"	230.1
01.02	2		"	"	238.2
3099.90	1		"	9.2	249.9
98.04	6		"	"	269.3
97.35	1		"	"	276.5
96.50	1n		"	"	285.3
94.8	1n		"	"	303.1
93.11	1		"	"	320.7
92.46	1		"	"	327.5
90.20	1		"	"	351.1
89.72	1		"	"	356.2
88.54	2		"	"	368.5
84.40	2n		"	"	412.0
84.10	1n		"	"	415.2
82.30	1		"	9.3	434.0
82.06	1		"	"	436.7
81.80	1		"	"	440.3
80.31	3		"	"	454.9
80.00	1		"	"	458.2
78.99	4		"	"	468.9
78.02	1		"	"	479.1
77.44	1		"	"	485.2
76.05	1n		"	"	499.9
75.18	1		"	"	508.1
72.92	1		"	"	533.0
72.22	2		"	"	540.4
70.95	3		"	"	554.1
69.35	1n		"	"	570.8
69.06	1		"	"	573.1
67.81	3		"	"	587.2
66.33	2nr		"	"	602.9
66.03	1		"	"	606.2
63.15	3r		"	"	636.6
61.79	2		"	"	652.0
61.4	1n		"	"	655.5
60.27	2		"	"	667.4
58.51	1		"	"	686.2
58.00	1n		"	"	691.8
51.90	1n		"	9.4	757.1
51.03	1n		"	"	766.4
49.9	1n		"	"	779
49.7	1n		"	"	781
49.16	2		"	"	786.5
47.06	2		"	"	809.1
45.67	1		"	"	824.0
43.20	1n		"	"	850.7
40.2	1n		"	"	883
38.7	1n		"	"	899
35.21	2		"	"	936.9
34.17	3		"	"	948.2
33.25	1n		"	"	958.5
32.08	1		"	"	971.3

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3031.40	1		0.91	9.4	32978.7
28.69	1		"	"	33008.1
27.9	1b		"	"	017
26.68	2		"	"	030.1
22.22	1		"	9.5	078.7
21.61	1		"	"	085.4
19.52	1		"	"	108.3
18.62	1		"	"	118.1
17.26	1		"	"	133.1
15.87	1		"	"	148.4
15.08	1n		"	"	157.1
13.80	1n		"	"	171.2
12.85	1n		"	"	181.8
11.75	1n		"	"	193.8
09.90	1		"	"	214.2
08.61	2		"	"	228.4
08.0	1n		"	"	235
07.75	1		"	"	237.9
07.03	2		"	"	245.9
06.10	1		"	"	256.2
02.51	2		"	"	295.9
01.37	2		"	"	308.6
2999.93	1		"	"	324.6
99.23	2r		"	"	332.3
97.11	1		"	9.6	355.9
95.90	2		"	"	369.4
93.91	3		"	"	391.5
91.82	1		"	"	414.9
91.20	1		"	"	421.8
88.33	3		"	"	455.8
86.92	1		"	"	469.7
86.20	1n		"	"	477.7
85.38	1		"	"	486.9
83.97	2		"	"	502.8
91.59	2		"	"	529.5
80.5	1n		"	"	542
78.80	8		"	9.7	560.9
77.4	1n		"	"	577
76.85	1n		"	"	582.8
76.18	1		"	"	590.3
75.06	2		"	"	603.1
74.15	2		"	"	613.3
73.67	2		"	"	618.4
72.36	1		"	"	623.4
71.63	1		"	"	641.8
68.81	2		"	"	673.8
65.64	1		"	"	709.8
65.05	1		"	"	716.5
64.17	1n		"	"	726.5
61.9	1n		"	"	751
61.62	2		"	"	755.6
58.20	1n		"	"	794.6
58.04	2		"	"	796.5
57.70	2		"	"	800.4
55.1	1n		"	"	830



THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2951.37	1		0.91	9.7	33872.8
50.60	1		"	"	881.7
50.02	1		"	"	888.4
49.15	1		"	"	898.3
46.75	1n		"	"	926.0
42.97	3		"	"	969.6
40.73	1		"	"	995.4
39.65	1		"	"	34008.9
38.27	2n		"	"	023.8
37.51	1		"	"	032.6
36.54	2		"	9.8	043.9
36.25	1		"	"	047.2
35.8	1n		"	"	052.5
33.19	1		"	"	082.9
32.59	5		"	"	089.2
31.00	1		"	"	108.2
29.33	1		"	"	127.1
28.77	2		"	"	134.2
28.30	2		"	"	139.7
25.70	2n		"	"	170.1
25.14	3		"	"	176.6
24.05	2n		"	"	189.3
22.68	2r		"	"	205.4
21.70	2		"	"	216.8
21.05	1n		"	"	224.4
20.44	1		"	"	231.6
19.91	1		"	"	237.8
17.90	2		"	"	261.4
17.50	1		"	"	266.1
17.13	1		"	"	270.5
16.55	1n		"	9.9	277.2
14.5	1b		"	"	301
12.82	1		"	"	321.2
12.10	1		"	"	329.6
11.42	1		"	"	337.6
10.71	2		"	"	346.0
10.31	2		"	"	350.7
08.41	1		"	"	373.1
06.05	1n		"	"	401.0
04.36	1		"	"	421.1
03.24	1		"	"	434.2
2899.81	2		"	"	475.1
99.52	1		"	"	478.5
99.03	6		"	"	484.4
98.40	1		"	"	491.8
97.19	1		"	"	506.3
96.81	4		"	10.0	510.8
95.24	1		"	"	529.5
95.25	1		"	"	565.2
91.87	2		"	"	569.7
91.35	2		"	"	575.9
89.1	1b		"	"	603
87.40	3		"	"	623.2
86.62	1		"	"	632.6
86.3	1n		"	"	636

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuum
			$\lambda +$	$\frac{1}{\lambda} -$	
2885.15	3		0.91	10.0	34650.1
84.38	3		"	"	659.4
82.61	1		"	"	680.7
82.13	1		"	"	686.6
81.24	1		"	"	697.3
79.65	1		"	"	716.4
79.30	1		"	"	720.7
76.51	1		"	"	754.3
75.73	1		"	"	763.8
71.83	1		"	10.1	810.9
70.95	1		"	"	821.6
70.51	3		"	"	826.9
70.04	1		"	"	832.6
68.73	1		"	"	848.5
64.74	1		"	"	897.1
62.66	1n		"	"	922.4
61.48	3		"	"	936.8
57.57	1		"	"	984.6
55.97	1		"	"	35004.3
55.00	1		"	"	016.2
54.22	1		"	"	025.6
52.60	1		"	"	045.6
51.4	1n		"	"	060
61.35	2		"	"	061.0
48.1	1n		"	10.2	101
47.45	1		"	"	108.9
45.98	1		"	"	127.1
42.90	2		"	"	165.1
41.25	1		"	"	185.6
40.25	1		"	"	197.9
39.33	1		"	"	209.3
37.40	5		"	"	233.3
36.14	1		"	"	249.0
34.57	2		"	"	268.5
33.46	1		"	"	282.3
32.48	4		"	"	294.5
30.54	1		"	"	318.5
30.02	1		"	"	325.2
28.10	1		"	"	349.2
27.90	1		"	"	351.7
26.95	2		"	"	363.9
24.78	3		"	"	390.8
23.70	1n		"	10.3	404.2
23.50	1 Pb ?		"	"	409.2
22.6	1b		"	"	418
22.14	1		"	"	425.8
21.75	1		"	"	428.7
20.46	1		"	"	444.9
19.41	2		"	"	458.1
16.18	1		"	"	498.8
14.71	1		"	"	519.3
14.44	1		"	"	520.7
11.49	1		"	"	558.0
09.08	2		"	"	588.5
07.40	2		"	"	609.8

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2803.52	1		0.91	10.3	35659.1
00.69	1		"	"	695.1
2799.22	1		"	10.4	713.8
98.80	1		"	"	719.2
97.17	1		"	"	740.2
94.39	2		"	"	775.6
91.55	1n		"	"	812.0
91.15	1		"	"	817.1
90.53	1		"	"	823.8
88.80	1		"	"	847.3
87.79	1		"	"	860.3
87.25	2		"	"	867.2
87.02	2		"	"	870.2
86.40	1		"	"	878.1
85.71	1n		"	"	887.1
85.09	1		"	"	895.1
84.48	2		"	"	902.9
84.20	1n		"	"	906.4
83.64	1n		"	"	913.7
83.18	2		"	"	919.6
80.85	1		"	"	949.8
80.58	1		"	"	953.3
78.85	1		"	"	975.7
77.94	1		"	"	988.5
76.98	1		"	10.5	999.8
75.22	2		"	"	36022.5
75.00	1		"	"	025.5
74.61	2*		"	"	030.6
71.63	3		"	"	069.4
70.95	2		"	"	078.2
68.97	4		"	"	104.0
65.97	3		"	"	143.2
65.24	2		"	"	152.7
64.76	2		"	"	159.0
63.73	2		"	"	171.5
61.7	1n		"	"	199
60.83	2n		"	"	210.5
60.52	2		"	"	214.5
59.93	1		"	"	222.3
57.30	1n		"	"	256.9
52.30	3		"	"	320.8
49.8	1n		"	10.6	356
49.67	1		"	"	357.4
48.93	1		"	"	367.2
47.98	1		"	"	380.0
47.77	1		"	"	382.5
47.29	2		"	"	388.9
44.1	1b		"	"	431
43.20	1		"	"	443.2
38.43	1		"	"	506.6
37.52	2		"	"	518.8
36.53	1		"	"	532.0
35.5	1b		"	"	546

\* Double.

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2734.48	2		0.91	10.6	36559.4
32.88	3		"	"	580.8
31.62	2		"	"	597.7
30.36	2		"	"	614.6
29.40	3		"	"	627.5
27.6	1n		"	"	652
27.4	1n		"	"	654
26.53	1		"	10.7	665.9
25.5	1n		"	"	688.5
23.43	1		"	"	707.7
22.46	2		"	"	720.7
21.81	3		"	"	729.6
21.46	1		"	"	734.3
20.02	1		"	"	753.7
19.57	1		"	"	762.5
16.36	2		"	"	803.2
15.20	1		"	"	819.0
14.75	1		"	"	825.1
11.59	1		"	"	868.0
10.1	1n		"	"	888
08.36	4		"	"	912.0
04.05	3		"	"	970.8
01.95	1		"	10.8	37009.5
00.9	1b		"	"	014
2698.84	1		"	"	042.1
97.67	1		"	"	058.2
96.94	1		"	"	068.3
95.93	1		"	"	082.1
95.65	3		"	"	086.0
95.31	2		"	"	090.6
94.10	3		"	"	107.4
92.50	3		"	"	129.4
91.29	1		"	"	146.0
88.42	1		"	"	185.8
87.22	3		"	"	202.2
86.77	6		"	"	209.1
84.43	3		"	"	240.9
81.09	3		"	"	287.5
79.07	1		"	10.9	315.5
78.2	1b		"	"	328
76.7	1b		"	"	348.5
75.80	1		"	"	361.1
73.77	2		"	"	389.5
71.7	1b		"	"	418
68.05	1		"	"	469.6
67.00	2		"	"	484.4
62.95	1		"	"	541.4
62.46	1		"	"	548.3
61.50	1		"	"	561.9
60.0	1n		"	"	583
58.77	1		"	"	600.4
52.22	1		"	11.0	693.3
50.71	2 Be?		"	"	714.7
50.00	1		"	"	724.8
49.62	1		"	"	725.4



THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2644.9	1n		0.91	11.0	37798
43.4	1n		"	"	820
42.75	1n		"	"	828.4
41.62	2		"	"	846.0
40.43	1		"	"	861.6
40.00	1		"	"	867.8
39.61	1		"	"	873.4
38.71	2		"	"	886.0
37.76	1		"	"	899.9
35.96	2		"	"	925.8
35.5	1n		"	"	932.5
33.45	1		"	"	962.0
30.13	1		"	11.1	38009.8
28.92	1		"	"	027.3
26.50	1		"	"	062.5
25.86	2		"	"	071.8
23.57	2		"	"	104.9
19.02	2		"	"	180.2
15.49	1		"	"	222.6
09.97	2		"	"	303.5
09.31	3		"	11.2	313.0
08.46	1		"	"	325.5
04.03	1		"	"	389.9
01.03	1n		"	"	434.1
00.72	3		"	"	439.7
2597.41	3		"	"	488.7
97.16	2		"	"	492.4
95.16	1		"	"	522.0
92.92	1		"	"	555.4
89.17	2		"	"	611.1
86.24	1		"	"	654.8
83.48	4		"	"	696.2
80.85	1 Ag?		"	11.3	735.6
80.48	1		"	"	741.1
79.56	2		"	"	743.9
76.44	1		"	"	801.8
74.60	1		"	"	829.7
71.72	5		"	"	873.2
67.92	3		"	11.4	930.6
66.70	3		"	"	949.1
65.70	3		"	"	964.3
64.50	6		"	"	982.6
62.04	1		"	"	39020.0
61.13	1		"	"	033.9
59.26	1		"	"	062.3
55.31	4		"	"	122.6
54.80	4		"	"	130.6
51.41	1		"	"	182.6
50.8	1n		"	"	192
50.12	1		"	"	202.0
49.66	4		"	11.5	207.9
49.21	3		"	"	216.1
48.24	1		"	"	227.0
48.01	2		"	"	234.8
45.80	1		"	"	268.9

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
2545.20	4		0.91	11.5	39278.1
42.70	1n		"	"	316.8
42.00	2		"	"	327.6
36.83	1n		"	"	407.7
36.65	3		"	"	410.5
35.96	1		"	"	436.8
34.45	1		"	"	444.8
33.73	1		"	"	456.0
32.56	1		"	11.6	474.2
30.06	3		"	"	513.1
29.63	1		"	"	519.9
28.45	2		"	"	538.3
26.02	1n		"	"	575.0
21.9	1b		"	"	641
20.77	1		"	"	658.8
20.26	1		"	"	666.8
16.56	1		"	"	725.1
14.40	4		"	"	759.3
12.81	8		"	11.7	784.5
11.35	1		"	"	807.3
10.09	1		"	"	827.5
08.02	1		"	"	860.4
05.71	1		"	"	897.1
04.39	2		"	"	918.2
03.00	1		"	"	940.4
01.21	5		"	"	968.9
2498.49	1		"	"	40012.3
97.69	3		"	"	024.8
97.35	3		"	"	030.8
95.47	1		"	"	060.9
94.74	1 Be?		"	11.8	072.6
89.72	2		"	"	153.5
77.07	1		"	11.9	359.1
75.41	4		"	"	385.3
74.09	5		"	"	407.0
70.74	2		"	"	461.8
68.27	1		"	"	502.3
67.75	2		"	"	510.8
66.27	1		"	"	535.1
63.30	7		"	"	584.1
61.99	1		"	"	605.6
61.38	1		"	12.0	615.7
59.08	1		"	"	653.6
58.87	1		"	"	657.1
56.94	1		"	"	789.0
56.41	1		"	"	797.8
50.91	1		"	"	802.4
45.64	1		"	12.1	803.7
41.38	9		"	"	948.3
39.39	1		"	"	981.7
37.65	1		"	"	41009.0
32.97	1		"	"	089.9
31.82	7		"	"	109.4
31.23	1		"	"	119.3
28.89	1		"	12.2	159.0
28.06	8		"	"	172.9

THORIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length (Exner and Haschek)	Intensity and Character	Wave-length (Lohse)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
2425.5	1b		0.91	12.2	41216
24.69	3		"	"	230.2
23.79	2		"	"	245.5
13.58	6		"	12.3	430.0
11.42	1		"	"	457.0
03.2	1n		"	12.4	498.8
2395.72	2		"	"	528.6
93.21	1		"	"	572.3
91.62	3		"	"	800.3
88.23	1		"	"	859.8
86.94	1		"	12.5	872.2
82.15	2		"	"	966.4
81.60	2		"	"	976.1
77.92	2		"	"	42041.0
75.92	1		"	"	076.4
75.19	1		"	"	089.4
73.90	1		"	"	112.3
71.50	4		"	"	152.9
69.04	2		"	"	163.1
68.18	1		"	"	214.0
67.12	1		"	12.6	232.9
63.19	4		"	"	313.0
62.32	1		"	"	318.7
57.30	1		"	"	408.8
55.99	2		"	"	432.4
55.35	1		"	12.7	443.9
54.16	1		"	"	465.3
51.81	1		"	12.8	507.8
40.72	3		"	"	709.0
35.59	3		"	"	803.8
28.67	1		"	12.9	930.2
27.01	1		"	"	960.7
24.80	3		"	"	43001.5
19.58	4		"	13.0	098.3
11.62	1		"	"	247
07.2	1n		"	"	333.6
01.32	3		"	13.1	440.3
2297.35	1		"	"	515.3
91.76	2		"	13.2	621.6
87.71	2		"	"	798.5
84.33	1n		"	"	763.3
81.69	2		"	"	814.0
80.54	1		"	"	836.1
78.93	1		"	13.4	867.0
57.7	1n		"	13.5	44279.5
49.6	1n		"	13.6	439
30.4	1n		"	"	821
28.9	1n		"	13.7	852
23.65	1		"	"	957
21.61	1		"	"	45098.6
21.15	2		"	13.8	008.0
06.75	1		"	13.9	301.7
2199.90	1		"	"	442.7
98.78	1		"	"	465.9
92.48	1		"	"	596.6

# APPENDIX O.

## MOLYBDENUM (ARC SPECTRUM).

Hasselberg, 'Kongl. Svenska Vetenskaps-Akadem. Handl.,' Bd. 36, No. 2, 1902.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
5893.67	4		1.61	4.6	16962.8
91.89	2		1.60	"	967.9
88.61	8		"	"	977.3
83.11	2		"	"	993.2
81.85	2		"	"	996.8
76.90	2		"	"	17011.2
69.57	4		"	"	032.4
69.05	2		"	"	033.9
61.66	2		"	"	055.4
58.52	8		"	"	064.6
51.80	4		1.59	"	084.1
49.99	4		"	"	089.4
49.16	3		"	"	091.9
40.25	2		"	"	118.0
35.87	2		"	4.7	130.7
25.50	3		"	"	161.2
25.28	2		"	"	161.8
21.00	2		"	"	174.5
16.00	2		"	"	189.2
15.76	2		"	"	190.0
14.14	2		"	"	194.7
09.30	2		"	"	209.1
08.54	2		"	"	211.3
06.46	2		"	"	217.5
02.95	4		"	"	227.9
00.72	4		"	"	234.5
5792.10	8		"	"	260.2
85.99	2		"	"	278.4
83.54	4		"	"	285.7
80.96	2		"	"	293.5
80.38	2		"	"	295.2
79.65	4		"	"	297.4
78.46	2		"	"	301.9
74.85	3		"	"	311.8
71.33	2		"	"	322.3
70.02	2		"	"	326.3
67.63	2		"	"	333.4
66.79	2		"	"	336.0
65.57	2		"	"	339.6
57.80	2		"	"	363.0
51.67	9		"	"	381.8



MOLYBDENUM (ARC SPECTRUM)—*continued*.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
5747.93	2	5712.0 Ti	1.59	4.7	17392.9
47.08	2		"	"	395.4
41.96	2		"	"	411.0
39.93	2		"	"	417.1
38.40	2		"	"	421.7
35.55	2		"	"	430.4
34.32	4		"	"	434.1
31.58	2		"	4.8	442.4
30.17	4		"	"	446.7
29.77	4		"	"	447.9
29.03	4		"	"	450.2
22.98	7		"	"	468.6
20.45	2		"	"	476.3
19.55	2		"	"	480.1
12.05	4		"	"	502.0
08.28	2		"	"	513.6
05.97	6		"	"	520.7
02.39	3		"	"	531.7
5699.87	4		"	"	539.5
98.53	4		"	"	543.6
96.30	3		"	"	550.5
95.66	2		"	"	552.4
95.10	2		"	"	554.1
94.64	2		"	"	555.6
89.39	9		"	"	571.8
87.93	2		"	"	576.2
83.20	4		"	"	590.9
78.18	5		"	"	606.4
74.77	5		"	"	617.1
73.92	4		"	"	619.7
72.35	2		"	"	624.6
67.57	3	5642.11 Ni	"	"	639.4
64.65	3		"	"	648.5
52.47	2		"	"	686.6
52.12	3		"	"	687.7
51.54	2		"	"	689.5
50.40	8		"	"	693.0
43.47	2		"	"	714.8
42.05	2		"	"	719.2
35.14	5		"	"	741.0
32.74	8		"	"	748.5
19.63	4		"	"	789.9
19.03	3		"	"	791.9
19.69	4		"	"	792.9
13.37	4		"	"	809.8
11.20	6		"	"	816.7
09.80	2		"	4.9	821.0
09.53	4		"	"	821.9
08.90	4		"	"	823.9
01.31	3		"	"	848.1
5596.62	3		"	"	863.0
91.84	4	5588.98 Ca	"	"	878.3
89.02	4		"	"	887.4
75.47	4		"	"	931.8
70.69	12		"	"	946.2

MOLYBDENUM (ARC SPECTRUM)—*continued*.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
5569.75	4	5543.41 Fe	1.59	4.9	17949.2
68.88	5		"	"	955.5
64.34	4		"	"	966.7
63.65	2		"	"	968.9
62.74	2		"	"	971.8
57.02	4		"	"	990.4
52.47	2		"	"	18006.1
44.78	4s		"	"	030.1
43.38	4s		"	"	034.6
41.93	2s		"	"	039.4
39.67	4s		"	"	046.7
34.85	2		"	"	062.4
33.26	12		"	"	067.6
32.00	2		"	"	071.7
27.27	4		"	"	087.2
26.81	4		"	"	088.7
20.93	3		"	"	108.0
20.32	3		"	"	110.0
17.73	2		"	"	118.5
11.77	2		"	"	138.1
06.75	12		"	"	154.6
03.82	3		"	5.0	164.2
02.18	4		"	"	169.6
01.78	4s		"	"	170.9
5499.77	2n		"	"	177.6
98.76	4s		"	"	180.9
97.18	3n		"	"	186.1
94.06	4		"	"	196.5
92.43	4		"	"	200.9
90.54	4		"	"	208.2
88.91	2		"	"	213.6
76.18	4		"	"	255.9
73.64	6		"	"	264.4
65.83	4		"	"	290.5
56.71	4		"	"	320.7
53.27	4		"	"	332.6
50.73	5		"	"	341.2
48.78	2		"	"	347.7
47.86	2		"	"	350.8
39.95	2		"	"	377.5
37.97	5		"	"	384.2
35.91	4		"	"	391.2
31.27	2		"	"	406.9
27.80	2		"	"	418.7
27.14	3		"	"	420.9
26.24	2		"	"	424.0
17.64	3		"	"	453.2
14.95	2		"	"	462.4
11.31	2		"	"	474.8
06.64	3		"	"	490.8
5397.63	3	5394.91 } Mn 94.84 }	"	5.1	521.5
94.75	4s		"	"	531.4
88.94	2		"	"	551.4
72.63	2		"	"	607.8

MOLYBDENUM (ARC SPECTRUM)—*continued*.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuum
			$\lambda +$	$\frac{1}{\lambda}$	
5367.30	4n		1.59	5.1	18626.2
64.50	7		"	"	636.0
60.76	9		"	"	649.0
56.70	4		"	"	663.1
55.76	2		"	"	666.4
55.12	4		"	"	668.6
27.35	2		"	"	666.0
24.70	2		"	"	675.3
20.14	2		"	"	796.4
18.20	2		"	"	798.3
14.13	4		"	"	812.7
06.49	2		"	"	839.8
5295.67	3		"	5.2	878.2
93.65	2		"	"	885.4
92.30	3		"	"	890.2
81.07	4		"	"	930.3
79.85	4		"	"	934.7
76.50	2		"	"	946.8
72.00	2		"	"	962.9
61.35	4		"	"	19001.3
59.23	4		"	"	009.0
45.71	4		"	"	058.0
43.01	4		"	"	067.8
41.09	6		"	"	074.8
38.41	6		"	"	084.6
34.47	4		"	"	098.9
32.58	2		"	"	105.8
31.27	2		"	"	110.6
19.62	3		"	"	153.3
12.08	2		"	"	181.1
00.97	2		"	5.3	223.8
00.37	4		"	"	224.0
5180.44	3		"	"	298.1
74.35	6		"	"	320.8
73.14	6		"	"	325.3
71.33	6		"	"	332.1
67.98	4		"	"	344.6
63.40	4		"	"	361.8
55.48	2		"	"	391.5
48.65	2		"	"	418.3
41.47	2		"	"	444.4
35.17	2		"	"	468.2
26.94	2		"	"	501.5
24.03	2		"	"	510.6
22.00	2		"	"	518.3
17.18	3		"	"	536.7
15.86	2		"	5.4	541.7
15.21	4		"	"	544.1
09.90	4	5109.83 Fe	"	"	564.5
00.58	2		"	"	600.2
5098.27	3		"	"	609.1
97.71	5	5097.67	"	"	611.3
96.85	4		"	"	614.6
96.11	3		"	"	616.4
92.96	2		"	"	630.9

MOLYBDENUM (ARC SPECTRUM)—*continued.*

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
5092.40	2	4957.88 Fe	1.59	5.4	19631.7
91.56	2		"	"	634.9
91.17	3		"	"	636.4
90.80	2		"	"	637.9
84.47	2		"	"	662.3
81.49	2		"	"	673.9
80.23	5		"	"	678.7
62.76	2		"	"	746.7
60.07	5		"	"	757.2
58.30	2		"	"	764.1
55.22	3		"	"	776.1
47.90	4		"	"	804.8
46.73	2		"	"	809.4
39.12	2		"	"	839.3
30.96	4		"	"	871.5
29.21	4		"	"	878.4
20.07	2		"	5.5	914.7
16.99	5		"	"	926.8
14.80	2		"	"	935.5
00.13	4		"	"	994.0
4995.55	2		"	"	20012.3
79.32	5		"	"	077.5
76.23	2		"	"	090.0
75.58	2		"	"	092.6
64.63	4		"	"	137.0
64.42	3		"	"	137.8
57.78	6		"	"	164.8
56.83	2		"	"	168.7
52.20	2		"	"	187.5
50.83	5		"	"	193.1
41.90	4		"	5.6	229.5
33.99	2		"	"	262.0
33.30	4		"	"	264.8
31.42	2		"	"	272.6
26.65	4		"	"	292.2
26.42	4		"	"	293.1
25.08	2		"	"	298.6
09.41	2		"	"	363.5
07.65	2		"	"	371.8
04.03	5		"	"	385.8
4899.81	2		"	"	410.5
97.50	2		"	"	413.0
94.65	2		"	"	424.9
89.44	2		"	"	446.6
86.70	2		"	"	462.3
78.59	3		"	"	492.1
75.73	2	4875.67 V	"	"	504.3
69.43	4		"	"	530.7
68.23	6		"	"	535.7
66.07	2		"	"	544.9
60.99	2		"	5.7	566.3
60.28	3		"	"	569.2
58.44	3		"	"	577.0
51.92	2		"	"	604.7
50.05	2		"	"	612.7



MOLYBDENUM (ARC SPECTRUM)—*continued*.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4815.38	2	4808.32 Fe	1.59	5.7	20632.5
39.82	2		"	"	656.2
38.35	2		"	"	662.0
35.98	2		"	"	672.6
34.16	4		"	"	680.4
33.13	2		"	"	684.8
30.73	6s		"	"	695.1
30.15	2		"	"	697.6
28.67	4s		"	"	704.0
23.16	2		"	"	727.6
22.62	2		"	"	729.9
19.47	6		"	"	743.4
17.92	4		"	"	750.1
14.68	2		"	"	764.2
11.28	5		"	"	778.7
08.63	2		"	"	790.0
08.29	4		"	"	791.7
05.78	4		"	"	802.6
05.13	2		"	"	804.9
4796.75	5s		"	"	841.7
94.81	2		"	"	850.2
94.03	3		"	"	853.9
93.60	4		"	"	855.4
92.96	4		"	"	858.2
88.39	2		"	"	878.1
87.83	2		"	"	880.6
86.68	4	{ 4786.73 Ni 86.70 V	"	"	885.6
85.34	5s		"	"	891.3
84.64	2	83.17	"	"	894.5
83.16 †	5		"	"	901.0
78.09	2	76.55 Cc	"	5.8	923.0
76.54 †	6 also V		"	"	929.9
75.87	5		"	"	932.8
74.42	4		"	"	939.1
73.64	4		"	"	942.6
73.47	3		"	"	943.2
64.64	4s		"	"	982.1
60.39	8		"	"	21000.9
58.71	5		"	"	008.3
56.06	2		"	"	020.0
53.56	2		"	"	031.1
51.31	2		"	"	041.0
50.60	5s		"	"	044.2
49.61	2		"	"	048.5
49.35	2		"	"	049.7
49.06	2		"	"	051.0
40.58	2		"	"	088.7
40.36	2		"	"	089.6
36.84	2		"	"	105.3
35.51	2		"	"	111.2
34.34	2		"	"	116.5
31.64	7		"	"	129.4
29.36	6		"	"	138.7
25.55	2		"	"	155.7

## MOLYBDENUM (ARC SPECTRUM)—continued.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuum
			$\lambda +$	$\frac{1}{\lambda} -$	
4723.50	2		1.59	5.8	21164.9
23.27	3		"	"	175.9
19.08	4		"	"	185.0
18.13	5		"	"	189.0
16.88	2		"	"	194.7
14.69	4		"	"	204.3
10.16	2		"	"	224.9
08.43	6		"	"	232.7
07.44	7	4707.46 Fe	"	5.9	237.2
06.40	2		"	"	241.7
06.25	4	also Cr	"	"	242.4
00.71	4		"	"	267.5
4696.71	3		"	"	285.6
96.06	2		"	"	288.6
93.55	2		"	"	299.9
92.89	2		"	"	302.9
92.19	2		"	"	306.1
91.05	4		"	"	311.3
88.41	5	4688.46 Fe	"	"	323.3
86.28	4		"	"	333.0
86.01	4		"	"	334.2
84.54	2		"	"	340.9
84.04	3		"	"	343.2
82.44	2		"	"	350.5
81.82	2		"	"	353.3
81.24	2		"	"	356.0
75.91	2		"	"	384.9
73.24	2		"	"	392.5
72.11	6		"	"	397.7
69.00	2		"	"	412.0
65.59	2		"	"	427.6
63.31	2		"	"	438.0
62.95 †	6	62.93	"	"	439.7
62.11	5		"	"	443.6
57.67	2		"	"	464.0
56.57	2		"	"	469.1
52.47 *	4		"	"	488.0
51.25	4		"	"	493.6
49.28	3		"	"	502.8
48.02	4s		"	"	508.6
42.90	3		"	"	532.4
41.78	2		"	"	537.6
41.12	2		"	"	540.6
35.22	2		"	6.0	572.6
32.75	2		"	"	579.5
30.20	4s		"	"	591.3
27.70 †	5	27.73	"	"	603.0
26.67	7	also V 4626.74 Mn	"	"	607.8
24.44	4		"	"	618.2
23.66	3s		"	"	621.9
21.57	5s		"	"	631.7
18.15	2s		"	"	647.7
17.82	2		"	"	649.2
16.81 *	2		"	"	654.0

\* Probably not due to Molybdenum.

† Coincident with Fraunhofer lines.

MOLYBDENUM (ARC SPECTRUM)—*continued*.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuum
			$\lambda +$	$\frac{1}{\lambda} -$	
4614.94	2	4610.09	1.59	6.0	21662.7
11.36	4s		"	"	679.6
11.03	2		"	"	681.0
10.07 ‡	6		"	"	685.6
08.90	2s		"	"	696.1
08.32	2		"	"	693.9
03.75	2		"	"	715.3
4599.35	4		"	"	736.2
98.44	2		"	"	740.3
98.07	2		"	"	742.3
95.35	6		"	"	755.1
93.84	2		"	"	762.3
92.40	3s		"	"	769.1
90.55	4n		"	"	777.9
88.33	3n		"	"	788.4
87.61	2		"	"	791.8
86.98	2		"	"	794.8
86.75	2		"	"	795.9
86.25	2		"	"	798.3
82.69	2		"	"	815.2
82.52	2		"	"	816.0
79.92	2		"	"	828.4
78.06	2		"	"	837.3
77.97	2s		"	"	837.7
76.70	6s		"	"	843.8
76.05	2		"	"	846.9
75.36	2		"	"	849.2
74.80	2		"	"	852.9
74.66	2		"	"	853.5
70.78	2s	4560.27 Fe	"	"	872.1
70.30	4s		"	"	874.4
69.21	2		"	"	879.6
67.87	4		"	"	886.0
67.57	2		"	"	887.5
60.32	4s		"	6.1	922.2
59.94	2		"	"	924.0
58.92	3		"	"	928.9
58.30 ‡	5		"	"	931.9
54.00	4		"	"	952.6
53.52	3	58.29	"	"	954.9
53.40	3		"	"	955.5
53.00	2		"	"	957.4
41.75	4		"	"	22011.8
39.84	2		"	"	021.1
38.60	2		"	"	026.1
37.00	6		"	"	034.9
35.56	4		"	"	041.9
35.00	4		"	"	044.6
34.63	4		"	"	046.4
29.59	5	28.80 Fe	"	"	070.9
28.77	5		"	"	075.0
25.56	4		"	"	090.6
25.50	2		"	"	090.9
24.53	6		"	"	095.6
22.37	4		"	"	106.2

MOLYBDENUM (ARC SPECTRUM)—*continued*.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4518.61	2	4517.28 4517.32 Co	1.59	6.1	22124.6
17.58	4		"	"	129.6
17.30 †	6		"	"	136.1
15.36	4		"	"	140.5
15.20	3		"	"	141.3
12.32	5		"	"	155.4
06.86	4		"	"	182.3
06.22	6		"	"	185.4
06.13 }			"	"	185.9
01.44	4		01.42 Ti	"	"
4499.62	4	4464.94 Fe	"	"	218.2
94.27	2		"	6.2	244.3
92.24	2		"	"	244.4
92.00	2		"	"	255.6
91.46	6		"	"	258.3
90.37	4		"	"	263.7
89.17	3		"	"	269.6
87.23	4		"	"	278.7
85.16	5		"	"	289.5
75.82	4		"	"	336.1
74.78	8		"	"	341.3
73.37	5		"	"	348.3
72.23	3		"	"	354.0
71.85	3		"	"	355.9
68.46	6		"	"	372.9
68.28	2		"	"	373.8
64.96	6		"	"	390.4
60.80	4		"	"	411.3
58.84	3		"	"	421.2
57.55	7		"	"	427.6
52.77	3	2 also Ni	"	"	451.7
49.92	6		"	"	466.1
47.41	3		"	"	478.8
46.62	4s		"	"	482.8
44.21	2n		"	"	495.0
43.25	4s		"	"	499.8
42.37	5s		"	"	504.3
39.15	2s		"	"	520.6
37.35	2		"	"	529.7
37.06	4		"	"	531.2
33.68	3s	2 also Ni	"	"	548.4
29.32	2		"	6.3	570.5
28.39	2		"	"	576.3
26.86	5		"	"	583.3
24.40	2		"	"	585.6
23.79	5		"	"	598.8
23.24	2 also Ni		"	"	601.4
22.23	3		"	"	606.7
20.91	2		"	"	613.5
17.40	2		"	"	631.4
12.96	4	2 also Ni	"	"	654.2
11.90	6		"	"	659.7
11.76	5		"	"	660.4
10.15	4		"	"	668.6
09.61	2		"	"	671.4



MOLYBDENUM (ARC SPECTRUM)—*continued*.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4407.04	2		1.59	6.3	22684.7
04.71	3s		"	"	696.7
03.07	4		"	"	705.1
02.67	4		"	"	707.2
4398.68	2		"	"	727.8
97.48	4		"	"	734.0
97.02	2		"	"	736.4
96.83	4s		"	"	737.3
96.55	2		"	"	738.8
94.67	3		"	"	748.5
94.49	3		"	"	749.7
92.32	3		"	"	760.7
91.71	3		"	"	763.9
89.76	2		"	"	774.0
88.49	2		"	"	780.5
86.10	2		"	"	792.9
82.61	4		"	"	811.2
81.82	8		"	"	815.3
81.36	2		"	"	817.6
80.80	3s		"	"	820.6
80.47	4		"	"	822.3
76.87	2		"	"	841.1
75.21	3		"	"	849.7
75.07	2		"	"	850.4
73.52	2		"	"	858.6
72.31	2		"	"	864.9
70.33	2		"	"	875.3
69.23	5		"	"	881.0
66.73	4		"	6.4	894.0
64.90	2		"	"	903.6
64.76	2		"	"	904.3
64.65	3		"	"	904.9
63.82	3		"	"	909.3
63.21	2		"	"	912.5
62.87	2		"	"	914.3
62.20	3		"	"	917.8
57.50	3		"	"	942.5
54.88	2		"	"	956.3
53.48	4		"	"	963.7
50.53	6		"	"	979.3
49.41	2		"	"	985.2
46.40	2		"	"	23001.1
44.86	3		"	"	009.3
42.16	2		"	"	023.6
41.61	4		"	"	026.5
40.93	4		"	"	030.1
40.02	3		"	"	035.0
39.42	2		"	"	038.2
38.90	4		"	"	040.9
38.73	2		"	"	041.8
36.38	2		"	"	054.4
35.00	4		"	"	061.6
34.65	2		"	"	063.5
33.40	2		"	"	070.2
32.68	2		"	"	074.0

MOLYBDENUM (ARC SPECTRUM)—*continued.*

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4330.27	2		1.59	6.4	23086.9
29.82	3		"	"	089.3
29.50	2		"	"	091.0
26.33	6		"	"	107.9
25.44	2		"	"	112.6
24.72	2		"	"	116.5
22.60	2		"	"	127.8
22.17	4		"	"	130.3
18.46	2		"	"	150.0
18.13	5		"	"	151.8
15.60	2		"	"	165.4
13.74	2		"	"	175.3
13.16	3		"	"	182.4
12.98	3		"	"	179.6
10.58	4	{ 4310.63 10.54	"	"	192.3
08.85	2		"	6.5	201.8
05.10	4		"	"	221.8
04.20	3		"	"	226.5
01.45	3		"	"	241.5
4296.35	3		"	"	269.0
94.07	6		"	"	281.4
93.42	6		"	"	285.0
92.34	6		"	"	290.8
91.39	4		"	"	296.0
89.56	4	4289.50 Ca	"	"	305.9
88.82	6		"	"	309.5
87.26	4		"	"	319.4
84.77	6n		"	"	332.3
82.00	4		"	"	347.1
80.17	2		"	"	359.0
79.19	2		"	"	362.4
77.58	4	77.54 Zr	"	"	371.2
77.38†	6	77.38	"	"	372.3
77.08	6		"	"	373.9
75.86	2		"	"	380.6
74.22	2		"	"	389.5
73.23	3s		"	"	395.0
72.24	3		"	"	400.4
69.44†	5	69.45	"	"	415.8
68.25	4		"	"	422.3
66.27	4		"	"	433.2
64.81	2		"	"	441.2
61.63	3		"	"	458.7
61.17	2		"	"	461.3
60.85	3	60.89	"	"	463.0
60.52	3		"	"	464.8
58.85	2		"	"	472.0
53.77	2		"	"	502.0
52.69	2		"	6.6	507.9
52.03	5		"	"	511.6
51.58	2		"	"	514.1
50.87	3		"	"	518.0
46.19	5	46.25 Fe	"	"	543.9
44.95	3n		"	"	550.8

MOLYBDENUM (ARC SPECTRUM)—*continued*.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4242.97	3		1.59	6.6	23561.8
41.03	5		"	"	572.6
40.48	4		"	"	575.6
40.26	4 also V		"	"	576.8
39.37	4		"	"	581.4
39.25	4		"	"	582.5
35.23	3		"	"	604.8
33.68	3		"	"	613.5
32.75	6		"	"	618.7
26.44	3		"	"	654.0
25.10	2		"	"	661.5
24.93	2		"	"	662.4
24.10	2		"	"	666.1
23.15	3		"	"	672.4
22.59	3		"	"	675.5
20.17	2		"	"	688.1
19.55	4	{ 4219.58 Fe 19.52 Fe	"	"	692.6
19.20	2		"	"	694.6
17.02	2		"	"	706.8
14.24	3		"	"	722.5
11.23	4		"	"	739.5
10.39	2		"	"	744.2
09.84	2		"	"	747.3
08.97	2		"	"	753.2
07.75	2		"	"	759.1
07.42	2		"	"	761.0
06.00	4		"	"	769.0
04.80	3		"	"	775.7
02.42	2		"	"	788.2
01.50	3		"	"	794.4
01.35	2		"	"	795.3
00.76	3		"	"	798.6
00.02	2		"	6.7	802.7
4199.82	2		"	"	803.8
94.74	5		"	"	832.7
94.20	2		"	"	835.8
88.49	8		"	"	868.2
86.97	4		"	"	876.9
85.98†	6	4185.94	"	"	882.6
84.59	2		"	"	890.5
84.33	2		"	"	892.0
81.24	4		"	"	909.6
80.69	3		"	"	912.8
80.12	3		"	"	916.0
78.72	2		"	"	924.1
78.45	4		"	"	925.6
77.45	4		"	"	931.3
77.09	3		"	"	933.4
75.32	2		"	"	943.6
71.65	2		"	"	964.6
71.27	3	71.21 Ti	"	"	966.8
70.55	2		"	"	971.2
70.01	4	69.93 Fe	"	"	974.1
68.68	3		"	"	981.7

MOLYBDENUM (ARC SPECTRUM)—*continued.*

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4166.47	3	4162.83	1.59	6.7	23994.4
65.94	2		"	"	997.5
64.26	3		"	"	24007.1
62.85†	5		"	"	015.3
60.44	2		"	"	029.2
58.27	2		"	"	041.7
57.59	5		"	"	045.7
55.77	5		"	"	056.8
55.47	5		"	"	058.0
52.07†	4		"	"	077.7
49.90	2	52.11	"	"	090.3
49.14	5		"	6.8	094.6
48.88	2		"	"	102.3
43.73	8		"	"	126.0
42.28	2		"	"	134.5
39.72	2		"	"	149.4
38.72	3		"	"	155.3
38.35	3		"	"	156.9
37.10	2		"	"	164.7
35.55	2		"	"	173.8
35.37	2	19.05 Fe	"	"	174.8
33.18	2		"	"	187.6
32.90	2		"	"	189.3
32.41	4		"	"	192.1
32.07	4		"	"	194.1
29.02	4		"	"	212.0
28.46	4		"	"	215.3
24.72	4		"	"	217.3
23.83	4		"	"	242.5
22.55	2		"	"	250.0
20.26	6	08.29	"	"	263.5
19.18	2		"	"	269.9
19.12†	4		"	"	270.2
15.08	4		"	"	294.2
13.77	2		"	"	301.8
12.29	2		"	"	310.5
10.88	2		"	"	318.9
10.46	2		"	"	321.4
08.30	3		"	"	334.2
07.63	6		"	"	338.1
05.72	4	02.32 V	"	"	349.4
05.27	4		"	"	352.1
03.94	3		"	"	360.0
02.33†	5		"	"	369.6
4098.91	4		"	6.9	389.8
96.98	4		"	"	401.3
94.63	2		"	"	415.3
93.32	2		"	"	423.1
89.90	3		"	"	443.6
86.16†	4	4086.13 84.58	"	"	466.0
84.54†	6		"	"	475.7
81.94	4		"	"	491.3
81.62	6		"	"	493.2
78.25	2		"	"	513.4

† Not coincident with Fraunhofer line.



MOLYBDENUM (ARC SPECTRUM)—*continued*.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4076.69	3	{ 4076.80 76.64	1.59	6.9	24522.8
76.35	4		"	"	524.8
75.72	4		"	"	528.6
75.43	4		"	"	530.4
70.17	4		"	"	562.0
70.05	6		"	"	562.8
67.88	2		"	"	582.4
66.52	4	66.52 Co	"	"	584.2
62.24	5		"	"	610.0
59.79	4		"	"	624.9
57.77	3 also Ti		"	"	637.2
57.61	2		"	"	638.1
56.18	4	{ 56.22 Cr 56.13 Fe	"	"	646.8
51.35	2		"	7.0	676.1
50.27	2		"	"	682.6
49.75	2		"	"	685.9
47.75	2		"	"	698.2
47.56	2		"	"	699.2
47.07	2		"	"	702.2
43.91	3		"	"	721.5
43.44	2		"	"	724.4
43.05	4		"	"	726.8
41.30	3		"	"	737.5
38.26	4		"	"	755.6
37.95	4		"	"	758.0
36.83	2		"	"	764.9
43.11	2		"	"	787.7
32.65	3	32.61 Fe V	"	"	790.6
31.60	2		"	"	797.0
31.06	2		"	"	800.4
28.80	3		"	"	814.3
27.07	2		"	"	824.9
25.64	3		"	"	833.8
21.19	4		"	"	861.2
20.59	3	{ 20.64 Fe 20.55 Sc	"	"	865.0
19.32	2		"	"	872.8
17.55	3		"	"	883.8
16.86	2		"	"	888.1
12.97	2		"	"	912.2
12.68	2		"	"	914.0
12.42	2		"	"	915.6
12.12	4n		"	"	917.4
09.53	4		"	"	933.6
08.21	2		"	"	941.8
07.62	2		"	"	945.4
06.85	2		"	"	950.2
06.23	4		"	"	954.1
05.86	2 also V		"	"	956.4
03.62	2		"	7.1	970.2
00.67	4	00.61 Fe	"	"	986.7
00.55	4		"	"	989.4
3998.45	4		"	"	25002.6

MOLYBDENUM (ARC SPECTRUM)—*continued*.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3995.66	1		1.59	7.1	25020.6
94.79	2		"	"	025.5
94.06	4		"	"	030.1
93.22	3		"	"	035.3
92.02	4		"	"	042.9
91.55	4		"	"	045.8
86.45	4		"	"	077.9
85.88	3		"	"	081.5
84.92	2		"	"	087.5
82.22	4		"	"	100.7
81.80	3		"	"	107.2
80.87	3		"	"	113.0
80.37	4		"	"	116.2
79.40	4		"	"	122.3
78.08	4		"	"	130.6
74.09	4		"	"	155.9
73.92	4		"	"	157.0
73.10	2		"	"	162.1
71.54	3		"	"	172.1
69.17†	2	3969.29 Cr, Co	"	"	187.1
68.91	4		"	"	188.9
66.40	3		"	"	204.7
65.89	3		"	"	208.4
64.14	4		"	"	219.0
63.68	3		"	"	222.0
60.12	2	61.57 Al	"	"	245.6
59.83	2		"	"	246.5
59.03	2		"	"	251.6
58.76	4		"	"	253.3
55.66	4		"	7.2	273.1
54.08	4		"	"	283.1
51.70	2		"	"	298.4
51.49	2		"	"	299.7
51.14	4		"	"	301.9
50.40	2		"	"	306.7
47.33	4		"	"	326.4
47.00	2		"	"	328.5
45.41	4	45.47 Co	"	"	338.7
43.66	4	44.10 Al	"	"	350.0
43.19	6		"	"	353.0
40.50	2		"	"	368.2
39.65	2		"	"	375.8
39.30	2		"	"	378.0
38.88	3		"	"	380.7
36.89	2		"	"	393.6
36.30	2		"	"	397.4
35.33	3		"	"	403.6
35.13	4		"	"	404.9
34.41	3		"	"	409.6
31.57	3		"	"	427.9
30.35	3		"	"	435.8
28.95	3		"	"	444.9
28.86	3		"	"	445.5
28.45	3		"	"	448.1
26.00	2		"	"	464.0

MOLYBDENUM (ARC SPECTRUM)—*continued*.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuum
			$\lambda +$	$\frac{1}{\lambda} -$	
3924.78	2		1.59	7.2	25471.9
23.91	4		"	"	477.6
22.49	4		"	"	486.8
21.09	2		"	"	495.9
20.25	2		"	"	501.4
17.95	4		"	"	516.4
17.70	4		"	"	518.0
17.09	4		"	"	521.9
16.62	2		"	"	525.0
15.60	2		"	"	531.7
13.52	3		"	"	545.2
12.10	3		"	"	554.2
11.24	3 <sub>n</sub>		"	"	560.1
09.92	3		"	"	568.8
08.42	3		"	7.3	578.5
07.10	4		"	"	587.1
03.07	20 <sub>n</sub> , r		"	"	613.6
01.95	5		"	"	621.0
00.87	2		"	"	628.0
00.40	2		"	"	631.1
3897.68	2		"	"	649.0
97.05	3		"	"	653.1
96.55	3		"	"	656.4
93.50	2	3893.54 Fe	"	"	676.5
90.88	3	93.45 Co	"	"	693.8
89.06	4		"	"	705.9
88.36	4		"	"	710.5
88.15	2		"	"	711.9
87.87	2		"	"	713.7
86.98	5	86.94	"	"	719.6
79.20	2		"	"	771.2
74.34	3	74.32 Ti	"	"	803.5
73.30	3	73.25 Co	"	"	810.4
70.77	3		"	"	827.3
70.62	3		"	"	828.3
69.25	5		"	"	837.5
66.87	2		"	"	853.4
64.25	20 <sub>n</sub> , r	64.25 Mo, C	"	"	870.9
56.15	3		"	"	925.2
55.09	2		"	"	932.4
52.17	4		"	"	952.0
51.57	2		"	"	956.2
49.95	2		"	"	967.1
48.45	4	48.48 Ti	"	"	977.2
47.41	4		"	"	984.2
46.36	3		"	"	991.3
46.12	1		"	"	992.9
44.09	3		"	"	26006.6
40.72	2		"	"	029.5
39.65	2		"	"	036.8
35.49	4 <sub>n</sub>		"	"	065.0
35.15	3		"	"	067.3
34.82	3		"	"	069.5
33.92	6		"	"	075.7
32.26	4		"	"	087.0

MOLYBDENUM (ARC SPECTRUM)—*continued*.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3831.95	2	3831.00 } Fe 30.90 }	1.59	7.3	26089.1
31.25	3		"	"	093.8
30.98	4		"	"	095.7
30.22	4		"	"	100.9
30.08	2		"	"	101.8
29.95	3		"	"	102.7
29.04	6		"	"	108.9
27.33	4		"	"	120.6
26.85	5		"	"	123.9
25.63	2		"	"	132.2
25.50	3		"	"	133.1
24.94	3		"	"	136.9
24.34	3		"	"	142.0
23.17	4		"	"	149.0
22.14	2		"	"	154.9
21.82	2		"	"	158.2
21.09	3		"	"	163.2
19.98	5		"	"	171.8
18.83	4		"	7.4	178.7
17.37	2		"	"	188.6
15.24	3		"	"	203.3
14.64	2		"	"	207.4
12.63	4s		"	"	221.2
11.56	3s		"	"	228.6
10.99	2		"	"	232.5
10.31	2		"	"	237.2
08.79	3		"	"	248.3
08.04	2		"	"	252.8
07.82	2		"	"	254.3
06.15	4		"	"	265.9
04.70	4		"	"	275.9
02.35	2		"	"	292.1
02.00	5	01.98	"	"	294.6
00.28	2	3798.40 Mo	"	"	306.4
3798.39	20nr		"	"	319.5
97.46	4		"	"	326.0
97.20	3		"	"	327.9
96.45	2		"	"	332.9
96.19	3		"	"	334.8
95.48	2		"	"	339.7
94.60	4		"	"	345.8
88.42	4		"	"	388.8
86.54	2		"	"	401.9
85.67	3		"	"	408.0
85.19	4		"	"	411.4
82.86	2		"	"	427.6
82.35	3		"	"	431.2
81.75	5		"	"	435.4
80.78	2		"	"	442.3
79.92	4		"	"	448.2
77.90	3		"	"	462.3
76.73	2		"	"	469.8
76.27	2		"	"	473.8
72.99	4		"	7.5	496.7
72.11	4		"	"	502.8



MOLYBDENUM (ARC SPECTRUM)—*continued*.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3770·66	5		1·59	7·5	26513·0
68·92	3		"	"	525·3
68·78	2		"	"	526·3
67·90	2		"	"	532·5
66·58	2		"	"	541·8
65·92	3		"	"	546·5
65·40	4		"	"	550·2
65·21	2		"	"	551·5
64·60	3		"	"	555·7
64·20	2		"	"	558·5
63·52	4		"	"	563·3
	{ also Mn		"	"	
62·27	3		"	"	572·1
61·93	4		"	"	574·6
61·07	4		"	"	580·7
59·80	3		"	"	589·6
58·70	4		"	"	597·4
56·02	3		"	"	616·4
55·68	2		"	"	619·0
55·31	4		"	"	621·5
52·12	2		"	"	644·1
51·38	4		"	"	649·5
48·66	4		"	"	668·7
47·37	4		"	"	677·9
45·12	3		"	"	693·9
44·55	4		"	"	698·0
43·98	2		"	"	702·0
42·48	5		"	"	712·6
40·97	2		"	"	723·5
38·10	4		"	"	744·0
36·36	2		"	"	756·5
35·80	3		"	"	760·5
34·56	3		"	"	769·4
33·59	2		"	"	776·4
33·22	4		"	"	779·0
32·91	6		"	"	781·3
30·75	2		"	"	796·8
28·70	4		"	"	811·5
28·50	3		"	"	813·0
27·86	6	3727·78 Fe	"	7·6	817·4
26·45	4		"	"	827·6
25·75	4		"	"	832·6
24·00	2		"	"	845·2
23·70	3		"	"	847·6
22·50	2		"	"	856·0
20·42	4		"	"	871·1
19·87	2		"	"	875·1
19·71	2		"	"	876·2
18·66	2		"	"	883·8
17·05	2		"	"	895·5
16·27	4		"	"	901·1
15·83	2		"	"	904·3
14·73	3		"	"	912·3
13·64	4		"	"	920·2
12·22	3		"	"	930·4

MOLYBDENUM (ARC SPECTRUM)—*continued.*

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
3711.68	3		1.59	7.6	26934.4
10.32	3		"	"	944.2
08.73†	4	3708.79	"	"	955.8
07.35	3		"	"	965.8
05.57	2		"	"	978.8
02.67	4	02.63	"	"	999.9
02.33	2		"	"	27002.4
01.67	2		"	"	007.2
00.15	3		"	"	018.3
3698.69	3		"	"	029.0
96.18	3	3696.17 Fe	"	"	047.3
95.09	7		"	"	055.4
93.52	4		"	"	066.8
92.79	4	92.79 Fe	"	"	072.2
92.24	3		"	"	076.2
90.72	5		"	"	087.4
90.30	2		"	"	090.5
89.13	4		"	"	099.1
88.45	4		"	"	104.1
88.12	2		"	"	106.5
87.12	2		"	"	113.8
86.72	4		"	"	116.0
86.27	4		"	"	120.1
84.48	3		"	"	133.3
82.12	2		"	7.7	150.6
81.88	4		"	"	152.3
81.69	3		"	"	153.7
80.85 }	7	80.80	"	"	159.8
80.75 }			"	"	160.7
80.36	2		"	"	163.5
79.39	3		"	"	170.7
77.83	4	{ 77.83	"	"	182.2
		77.76 Fe	"	"	
76.40	4		"	"	192.8
76.15	3	76.11 Fe	"	"	194.6
75.54	4		"	"	199.2
73.38	3		"	"	215.1
72.97	6		"	"	215.2
69.50†	5	69.54	"	"	244.0
68.63	3		"	"	250.4
66.87	4	66.91 Fe	"	"	264.5
64.98†	6	64.97	"	"	277.7
64.45	4		"	"	281.5
63.83	2		"	"	286.1
63.14	4		"	"	291.3
61.91	4		"	"	300.4
61.24	3		"	"	305.5
61.08	4		"	"	306.7
59.51	7		"	"	318.4
58.50	2		"	"	325.9
57.53	5	57.56 Fe	"	"	333.1
55.21	3		"	"	350.5
54.73	4n	{ 54.81 Fe	"	"	354.2
		54.74 Ti	"	"	
		54.6 Cu	"	"	

MOLYBDENUM (ARC SPECTRUM)—*continued*.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3653.75	2	3649.65 Fe	1.59	7.7	27361.4
51.48	4		"	"	378.4
50.75	2		"	"	383.9
49.61	3		"	"	392.5
48.75	4		"	"	398.9
47.03	2		"	"	411.9
42.37	4		"	"	446.9
41.16	4		"	"	456.0
41.08	4		"	"	456.7
40.76	4		"	"	459.1
38.72	3	37.69	"	7.8	474.4
38.57	3 also V		"	"	475.5
38.35	5		"	"	477.2
37.68	4		"	"	482.2
35.77	3		"	"	496.7
35.57†	5		"	"	498.2
35.30	4		"	"	500.2
29.45	5		"	"	544.6
28.80	3		"	"	549.5
28.50	2		"	"	551.7
26.33†	5 also Fe	26.33	"	"	568.3
24.77	3		"	"	580.2
24.60	6		"	"	581.4
23.36	4		"	"	589.4
17.01	4		"	"	639.3
15.91	3		"	"	647.7
15.32†	3		"	"	652.2
14.87	2		"	"	655.7
14.42	6		"	"	659.2
13.94	3		"	"	662.8
13.80	3	23.36 Fe	"	"	663.9
13.55	4		"	"	665.8
12.62	4		"	"	672.9
12.15	4		"	"	676.5
10.80	2		"	"	686.9
08.52	4		"	"	704.4
07.56	2		"	"	711.8
05.19	2		"	"	729.0
04.73	3		"	"	733.5
04.24	4		"	"	737.3
03.86	3	{ 03.92 Ti 03.83 Cr	"	"	740.2
03.10	5		"	"	746.1
00.04	3		"	"	769.7
3599.05	4		"	"	777.3
96.54	2		"	"	796.7
95.87	4		"	"	801.9
95.71	4		"	"	803.1
94.73	2		"	7.9	810.6
91.55	3		"	"	835.2
90.90	4		"	"	840.3
90.47	2	3589.05	"	"	843.6
89.10	4		"	"	854.2
87.02	4		"	"	870.4
85.74	2		"	"	880.4

MOLYBDENUM (ARC SPECTRUM)—*continued*.

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3584.42	3	3573.97 Fe	1.59	7.9	27890.6
83.30	8		"	"	899.3
82.03	7		"	"	909.2
81.15	2		"	"	916.1
80.70	4		"	"	919.6
76.35	3		"	"	953.5
75.88	8		"	"	957.2
75.78	3		"	"	958.0
74.63	3		"	"	967.0
74.05	5		"	"	971.5
71.42	3		"	"	992.1
70.82	5		"	"	996.9
70.63	3		"	"	998.3
66.91	2		"	"	28027.6
66.57	2		"	"	030.2
66.20	4		"	"	033.1
64.45	3		"	"	046.9
63.91	4		"	"	051.2
63.30†	5	63.30	"	"	055.9
62.26	4	60.28	"	"	064.1
60.28†	4		"	"	079.7
59.42	2	58.21	"	"	086.5
58.25	6		"	"	095.7
57.63	2		"	"	100.7
55.58	3		"	8.0	116.7
54.35	4		"	"	127.1
52.57	2		"	"	140.6
51.12	3		"	"	152.1
48.88	2		"	"	169.4
48.05	2		"	"	176.5
47.57	2		"	"	180.3
43.27	2		"	"	214.5
42.92	2		"	"	217.3
42.32	5		"	"	222.0
29.62	2		"	"	243.6
39.07	3		"	"	248.0
37.41	6		"	"	261.2
34.83	3n		"	"	281.9
31.44	2		"	"	309.0
26.08	2		"	"	352.1
25.11	4		"	"	359.9
24.76	4		"	"	362.7
22.52	3		"	"	380.8
21.56	5		"	"	388.5
21.32	3		"	"	390.4
21.17	3		"	"	391.6
18.35	4		"	"	414.4
17.70	4		"	"	419.6
14.93	2		"	"	442.1
13.86	3		"	"	450.7
10.93	3		"	"	474.5
08.26	5		"	8.1	496.2
07.45	2		"	"	502.6
07.16	2		"	"	505.0
05.45	4		"	"	518.9



MOLYBDENUM (ARC SPECTRUM)—*continued.*

Wave-length	Intensity and Character	Fraunhofer Lines (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3504.55	5	{ 3504.57 V 04.56 Fe	1.59	8.1	28526.2
3498.21	2		"	"	578.0
93.49	4	3476.07 Cu	"	"	616.5
92.98	2		"	"	620.8
92.05	2		"	"	628.4
91.92	2		"	"	629.4
90.42	2		"	"	641.7
84.05	4		"	"	694.1
82.55	4		"	"	706.5
81.95	3		"	"	711.4
80.26	3		"	"	725.4
79.60	4		"	"	730.8
76.15	4		"	"	759.3
75.19	4		"	"	767.2
71.09	3		"	"	801.2
69.80	2		"	8.2	811.9
69.39	4		"	"	815.2
68.70	2		"	"	821.0
68.02	4		"	"	826.7
67.13	3		"	"	834.1
66.98	4		"	"	835.3
65.81	3		"	"	845.1
63.78	3		"	"	862.0

‡ Certainly coincident with Fraunhofer lines.

† Not coincident with Fraunhofer lines.

## CALCIUM (SPARK SPECTRUM).

Eder and Valenta, 'Denkschr. k. Akad. Wissensch. Wien,' lxxviii. 1898.

Exner and Haschek, 'Sitzber R. Akad. Wissensch. Wien,' cvi. 1897.

Wave-length		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
6499.9	Seen but not measured	8	1.91	4.5	15380.5
93.9		10	"	"	394.4
71.9		8	1.90	"	447.0
62.8		10	"	"	468.8
49.99		8	"	"	499.5
39.4		10	1.89	"	525.0
6169.9		5	1.82	4.8	16203.0
69.4		5	"	"	204.3
66.8		5	1.81	"	211.2
62.5		10	"	"	222.5
22.5		10	1.80	"	328.5
02.99		8	"	"	380.6
5857.7		8s	"	5.0	17066.3
5603.009		5s	1.53	4.9	842.7
01.475		5s	"	"	847.5

CALCIUM (SPARK SPECTRUM)—*continued.*

Wave-length		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
5598.681		5s	1.53	4.9	17856.5
94.632		6s	"	"	869.4
90.324		4s	1.52	"	883.1
88.948		6n	"	"	887.6
82.167		4s	"	"	909.3
13.120		2b <sup>r</sup>	1.50	"	18133.7
5349.619		5s	1.46	5.1	687.8
5270.463		5s	1.44	5.2	968.5
65.720		5s	"	"	985.6
64.402		3s	"	"	990.3
62.365		3s	"	"	997.7
61.863		3s	"	"	999.5
5188.977		2s	1.42	5.3	19266.3
5041.920		1n	1.38	5.4	828.3
4878.360		4s	1.33	5.6	20493.1
4847.2		1n	"	5.7	624.8
4586.086		6b <sup>r</sup>	1.26	6.0	21799.1
81.618		5s	"	"	820.3
78.780		4s	1.25	"	833.9
27.183		4b <sup>r</sup>	1.24	6.1	22082.7
4481.34	4481.7	2n Mg?	1.23	6.2	308.6
67.929		1n	1.22	"	375.5
66.625		1n	"	"	382.1
56.786		3s	"	"	431.5
56.057	56.06	7s	"	"	435.2
54.919	54.93	7n	"	"	440.9
44.087		1	"	"	495.6
42.963		1	"	"	501.3
35.838	35.84	6s	"	"	537.4
35.124	35.12	6n	"	"	541.1
25.616	25.62	8b	1.21	6.3	589.4
4355.467		3b <sup>r</sup>	1.19	6.4	953.2
33.932		1	"	"	23067.3
30.313		2	"	"	086.6
18.798	4318.79	8	1.18	"	148.2
14.148		2	"	"	173.1
10.585		1	"	"	192.3
07.864	07.92	5	"	6.5	213.4
02.676	02.70	9	"	"	234.8
4299.133	4299.14	8	"	"	254.0
89.534	89.55	8	"	"	306.1
83.125	83.18	8	"	"	340.9
78.018		2	1.17	"	368.8
77.403		1	"	"	372.2
71.760		1b	"	"	403.1
40.515	40.55	2n	1.16	6.6	575.4
38.587		1n	"	"	586.2
26.870	26.88	8r	"	"	651.6
4130.98		1n	1.13	6.8	24200.5
27.96		1n	"	"	218.2
23.39		1n	"	"	245.1
4098.876		2b <sup>r</sup>	"	"	390.0
95.243		2b <sup>r</sup>	"	6.9	411.7
57.980		3s	1.12	"	635.9
3979.208		r'ghost?	1.10	7.1	25123.5

CALCIUM (SPARK SPECTRUM)—*continued.*

Wave-length		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda}$	
3973·908	3973·87	2s	1·09	7·1	25157·0
H 68·638	68·62	10r	"	"	190·5
57·960		r'ghost'?	"	"	258·4
57·232	57·23	4s	"	"	263·1
49·101	49·03	3s	"	7·2	315·0
K 33·803	33·81	10r	1·08	"	413·5
23·345		10r'ghost'?	"	"	481·2
15·388		1	"	"	533·1
09·980		1	"	"	568·4
05·691		4s	"	7·3	596·4
3856·153		2b	1·06	"	925·3
26·506		4s	"	"	26126·2
3759·419		3s	1·04	7·5	592·4
47·151		4b	"	"	679·4
37·090	3737·25	10b <sup>v</sup>	1·03	"	751·3
16·193		2b <sup>v</sup>	"	"	901·7
06·190	06·25	10b <sup>v</sup>	"	7·6	974·3
3696·429		2b <sup>v</sup>	1·02	"	27045·5
85·317		3s	"	"	127·1
53·606		2	1·01	7·7	362·5
44·466	3644·53	8	"	"	431·1
30·812	30·8	6b <sup>r</sup>	"	7·8	534·3
24·162	24·1	5b <sup>r</sup>	"	"	584·8
01·957		2b	1·00	"	754·9
3594·259		1s	"	7·9	814·2
87·156		4b	"	"	869·3
35·60		2s	0·98	8·0	28275·7
10·97		4s	"	"	474·2
05·00		5s	"	8·1	514·4
3487·87		2b <sup>v</sup>	0·97	"	662·7
74·96		2b <sup>v</sup>	"	"	769·2
56·58		2s	0·96	8·2	922·1
44·53		3s	"	"	29023·3
3387·99		3s	0·95	8·4	507·6
72·930		6s	0·94	"	639·4
61·374		6s	"	"	741·4
49·568		6s	"	8·5	846·1
49·199		4s	"	"	849·4
35·30		2s	0·93	"	973·8
32·26		2n	"	"	30001·2
29·60		3s	"	"	025·1
23·09		6s	"	8·6	083·9
3278·74		2s	0·92	8·7	490·8
61·70		4s	"	"	650·2
48·71		3s	0·91	8·8	772·7
42·11		3s	"	"	835·3
39·15		3s	"	"	863·5
36·70		5s	"	"	886·9
34·68		6s	"	"	906·2
24·42		1s	"	"	31004·5
23·00		2s	"	"	018·2
18·45		1	0·90	"	062·1
17·05		1	"	"	075·6
3181·409	3181·51	8b <sup>r</sup>	0·89	8·9	422·9
79·447	79·60	10b <sup>r</sup>	"	9·0	443·0

CALCIUM (SPARK SPECTRUM)—*continued*.

Wave-length		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda}$	
3170.2		1n	0.89	9.0	31534.8
59.013	3159.11	10b'r	"	"	646.5
03.92		2s	0.88	9.2	32208.1
3092.84		8s	0.87	"	323.5
88.11		4s	"	"	373.1
82.21		8s	"	9.3	435.0
78.67		3s	"	"	472.3
75.39		2s	"	"	506.9
73.06		1s	"	"	531.6
66.40		3n	"	"	602.2
09.32	3009.29	3s	0.85	9.5	33220.6
06.98	06.95	4s	"	"	246.5
2999.74		2	"	"	326.7
97.2	2997.41	1	"	9.6	354.9
95.08	95.04	3s	"	"	378.5
36.83		4n	0.83	9.8	34040.5
28.92		4n	"	"	132.5
2816.44		2n	0.80	10.3	35495.5
2660.53		4	0.77	10.9	37575.6
2575.22		3	0.75	11.3	38820.3
68.09		3	"	11.4	928.0
2398.73		2n	0.71	12.3	41676.4
73.24		2	0.70	12.5	42124.0
13.02		1	0.69	13.0	43220.5
09.20		1	"	"	292.0
2290.09		1	"	13.1	653.3
75.44		2	0.68	13.3	934.2
59.5		$\frac{1}{2}$ n	"	13.4	44244.2
08.95		2	0.67	13.8	45256.6
00.5		$\frac{1}{2}$ n	"	13.9	430.3
2198.03		2	"	"	481.5
33.0		$\frac{1}{2}\frac{1}{2}$	0.66	14.1	46868.2
31.2		$\frac{1}{2}\frac{1}{2}$	0.65	14.5	907.4
23.0		$\frac{1}{2}$	"	14.6	47088.6
13.01		1	"	14.7	311.2
03.47		1	"	14.8	525.7
2099.87		1	"	"	607.2
86.64		1	"	14.9	909.0
81.53		1	"	15.0	48026.6



## SCANDIUM (ULTRA-VIOLET SPARK SPECTRUM).

Exner and Haschek, 'Sitzber. kais. Akad. Wissensch. Wien,' cix. 1900.

Wave-length	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda}$	
4744.02	2	1.30	5.8	21073.4
41.25	2	"	"	085.7
37.86	1	"	"	100.8
34.30	1	"	"	116.6
29.40	1	1.29	"	138.5
4698.50	1	"	5.9	277.5
70.64	7	1.28	"	404.4
4574.17	1n	1.25	6.0	855.7
4431.57	3	1.22	"	22559.1
20.87	2	1.21	"	613.9
4315.85	15	"	6.2	646.5
00.64 *	20	"	6.3	716.6
85.01	4	1.20	"	797.7
74.70 *	20	"	"	852.4
59.22	1	"	6.4	933.5
54.80	3	1.19	"	956.8
25.24 *	20	"	"	23113.6
21.01 *	20	"	"	136.3
14.32	30	1.18	"	172.2
05.94	6	"	6.5	220.1
4294.98	5	"	"	276.5
80.05	1	1.17	"	357.7
47.02 *	100	"	6.6	539.3
38.22	1	1.16	"	588.2
32.12	1 Nb ?	"	"	622.2
29.98	1	"	"	634.2
4082.60 *	3	1.12	6.9	24487.3
68.8	2b	"	"	570.4
61.4	2b	"	"	615.1
54.70 *	3	1.11	"	655.8
47.96	2	"	7.0	696.8
23.86 *	8	"	"	844.7
20.56 *	8	"	"	862.7
14.68	8	1.10	"	901.8
3996.76 *	2	"	7.1	25013.2
89.21	1	"	"	060.5
88.13	1 Yb ?	"	"	067.3
44.9	1n	1.09	7.2	346.8
23.60	1	1.08	"	478.6
12.05 *	6	"	"	553.2
07.69	6	"	7.3	583.3
3678.65	3n r	1.02	7.7	27176.2
76.82	1	"	"	189.7
75.42	1	"	"	200.0
66.69	3	"	"	264.0
64.37	1	"	"	282.1
51.96 *	20	1.01	"	375.0
45.46 *	15	"	"	423.7
42.93 *	50	"	"	442.7
30.86	100	"	7.8	533.0
28.35	1n	"	"	552.9

SCANDIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3624.77	1n	1.00	7.8	27579.2
19.97	1 Yb ?	"	"	618.8
13.96 *	100	"	"	665.4
03.1	1b	"	"	746.0
3590.67	10	"	7.9	842.0
89.82	10	"	"	848.6
81.15	20	"	"	915.1
76.52 *	30	0.99	"	953.1
72.71 *	50	"	"	982.1
67.86	20	"	"	28020.1
58.72	20	"	"	092.1
35.88	15	0.98	8.0	274.2
3457.62	1	0.96	8.2	896.7
35.67	1	"	"	29089.7
29.59	1	"	8.3	149.7
3394.55	1n	0.95	8.4	449.6
85.6	1b	"	"	528.5
83.81	1	"	"	544.1
79.5	3nr	"	"	581.8
78.5	1nr	"	"	590.5
72.30	10	0.94	"	644.9
69.10	10	"	"	675.1
62.09	8	"	"	735.0
61.45	8	"	"	740.7
59.83	8	"	"	759.8
53.88 *	20	"	8.5	807.7
52.19	2	"	"	822.7
43.5	3b	"	"	900.3
31.4	2b	0.93	"	30008.8
17.9	1b	"	8.6	148.2
17.25	1n	"	"	145.9
13.0	3b	"	"	184.6
12.0	2b	"	"	193.7
3289.50	1 Yb ?	0.92	8.7	395.6
73.76	2	"	"	536.2
70.05	2	"	"	571.8
55.79	1	"	"	705.8
51.44	1	0.91	8.8	746.8
3199.6	1b	"	8.9	31245.0
91.2	1b	"	"	327.2
39.98	2n	"	9.1	838.2
33.32	2n	0.88	"	899.7
30.49	1 Nb ?	"	"	934.6
28.48	1n	"	"	955.1
26.2	1b	"	"	978.6
08.70	1n	"	9.2	32158.3
3082.80	1	0.87	9.3	428.7
65.32	5n	"	"	613.6
60.7	1n	0.86	"	663.0
53.12	4n	"	9.4	744.0
45.88	3n	"	"	821.8
40.15	2n	"	"	883.7
21.14	1	0.85	9.5	090.6
20.70	1	"	"	095.4
19.42	1	"	"	33109.5

SCANDIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length	Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
		$\lambda +$	$\frac{1}{\lambda} -$	
3015.46	1	0.85	9.5	33153.0
2989.20	3n	"	9.6	444.2
80.91	1	0.84	"	548.4
80.0	1b	"	"	547.5
74.17	1 Nb ?	"	"	613.2
13.1	1n	0.83	9.9	34308.2
2871.1	1b	0.82	10.1	809.9
66.2	1b	"	"	860.0
59.5	1b	0.81	"	961.1
58.40	1	"	"	974.2
26.88	3n	"	10.2	35364.5
22.4	3b	0.80	10.3	420.5
19.75	2n	"	"	453.8
01.6	1b	"	"	683.6
2790.94	1n	"	10.4	819.8
89.4	2b	"	"	839.5
82.6	1b	0.79	"	927.1
34.12	7	0.78	10.6	36543.7
2699.14	10	"	10.8	37027.4
84.3	1b	0.77	"	242.7
76.15	1n	"	10.9	346.4
67.7	1b	"	"	474.5
11.4	2b	0.76	11.1	38282.5
2563.30	4	0.74	11.4	991.2
62.65	3	"	"	39010.7
60.39	6	"	"	029.8
55.91	4	"	"	112.4
52.49	8	"	"	166.0
45.31	4	"	11.5	266.9
2400.44	1	0.71	12.3	41646.7
2363.95	1b	0.70	12.6	42289.5
2299.25	1n	0.69	13.1	43466.6
88.20	1n	"	"	675.6
73.21	3	0.68	13.3	963.6
51.94	1n	"	13.4	44391.7
32.98	1n	"	13.6	769.6

\* Rowland 4400.555, 4374.628, 4325.152, 4320.907, 4246.696 (Y?), 4082.589 Sc, Fe, Ti; 4054.714, 4023.834, 4020.547, 3996.682, 3911.963, 3651.940, 3645.475 Sc ?, 3642.912. 3613.947, 3576.527, 3572.712, 3553.875, also 5672.047 occur in Rowland's list of solar lines.

## INDIUM (ULTRA-VIOLET SPARK SPECTRUM).

Exner and Haschek, 'Sitzber. kais. Akad. Wissensch. Wien,' cviii. (2), 1899.

Wave-length	Intensity and Character	Previous Observations (Arc)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4511.55	50r	4511.44 K and R	1.24	6.1	22159.2
4375.13	2		1.20	6.3	850.1
09.72	1		1.18	6.4	23197.0
4177.69	2		1.15	6.7	930.0
02.01	50r	4101.87 "	1.13	6.8	24371.5
3835.2	3b		1.06	7.3	26067.0
3774.49	1		1.04	7.4	486.2
10.45	2		1.03	7.6	943.3
3633.27	1		1.01	7.8	27515.6
11.20	1		1.00	"	683.8
10.60	1		"	"	688.4
3519.33	1 Tl?		0.98	8.0	28406.5
3262.48	1 Sn		0.92	8.7	30642.8
58.64	3	3258.66 "	0.91	"	679.0
56.22	8r		"	"	701.8
3187.15	1n		0.90	8.9	31367.0
75.17	1 Sn		"	9.0	485.5
3039.45	4n r	3039.46 "	0.86	9.4	32891.3
34.23	1n Sn		"	"	947.9
08.30	10		"	9.5	33231.9
2983.51	8n		0.85	9.6	508.1
41.39	10		0.84	9.8	987.7
32.73	1	2932.71 "	0.83	"	34088.1
2890.35	4		0.82	10.0	587.8
40.11	1 Sn		0.81	10.2	35199.6
2754.03	1n	2753.97 "	0.79	10.5	36299.9
14.1	1n	14.05 "	0.78	10.7	833.9
10.39	2b	10.38 "	"	10.9	884.4
2658.7	1b Sn		0.77	11.2	37601.5
02.0	1b	2601.84 "	0.76	11.4	38420.8
2560.05	1b	2560.25 "	0.74	12.1	39050.3
2429.52	1n Sn	2429.76 "	0.72	12.7	41148.3
2350.84	1		0.70	13.0	42525.3
06.18	5		0.69	13.3	43348.7
2265.08	2		0.68	"	44135.3

## BERYLLIUM (ULTRA-VIOLET SPARK SPECTRUM).

Exner and Haschek, 'Sitzber. kais. Akad. Wissensch. Wien,' cviii. (2), 1899.

Wave-length	Intensity and Character	Previous Observations (Rowland)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4572.88	1	4572.9 Thalén	1.25	6.0	21867.1
3321.51	3	3321.5? Hartley	0.93	8.6	30098.2
21.23	3		"	"	100.7
3131.20	15	3130.2 "	0.88	9.1	31927.5
30.56	20r }		"	"	934.1
2650.71	7 double	2650.2 "	0.76	1.0	37714.7
2494.84	3 }	2493.9 "	0.73	1.7	40071.0
94.69	3 } <sup>r</sup>		"	"	073.5
2348.72	3		0.70	2.7	42562.7
48.58	1		"	"	566.2



## LITHIUM (SPARK SPECTRUM).

Eder and Valenta, 'Denkschr. kais. Akad. Wissensch. Wien,' lxxvii. 1898.  
 Exner and Haschek, 'Sitzungsber. kais. Akad. Wissensch. Wien, cvi. 1897.

Wave-length		Intensity and Character	Previous Observations (Kayser and Runge) (arc)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek			$\lambda +$	$\frac{1}{\lambda} -$	
6708·2	4603·10	10	6708·2	1·82	4·0	14903·1
6103·77		10	6103·77	1·66	4·4	16378·9
4972·11		4	4972·11	1·36	5·5	20106·7
		2n r		1·26	6·0	21718·5
4602·46	3232·91	10b r	4602·37	"	"	21721·5
4273·52		4n	4273·44	1·17	6·5	23393·4
4132·57		6b	4132·44	1·14	6·8	24191·2
3985·90		1n	3985·94	1·10	7·1	25081·3
3232·798	2815·55	5n	3232·77	0·91	8·8	30924·1
		1		0·80	10·3	35506·7
2741·57		2	2741·39	0·78	10·6	36464·9

## LITHIUM (OXYHYDROGEN FLAME SPECTRUM).

Ramage, 'Proc. Royal Soc.' lxxi. 1902, p. 164.

Wave-length	Intensity and Character	Previous Observations (Kayser and Runge) (arc)	Reduction to Vacuum		Oscillation Frequency
			$\lambda +$	$\frac{1}{\lambda} -$	
6708·0	10 P2	6708·2	—	—	—
6103·84	9 A3	6103·77	1·66	4·4	16378·7
4971·98	2 B4	4972·11	1·36	5·5	20107·2
4603·07	7 A4	4602·37	1·26	6·0	21718·6
4273·34	1 B5	4273·44	1·17	6·5	23394·4
4132·93	5 A5	4132·44	1·14	6·8	24189·1
3985·86	1 B6	3985·44	1·10	7·1	25081·6
3915·59	3 A6	3915·2	1·08	7·2	25531·7
3795·18	2 A7	3794·9	1·05	7·4	26341·8
3719·0	1 A8	3718·9	1·03	7·6	26881·3
3232·82	4 P3	3232·77	0·91	8·8	30923·9
2741·43	1 P4	2741·39	0·78	10·6	36466·7

## THALLIUM (ULTRA-VIOLET SPARK SPECTRUM).

Exner and Haschek, 'Sitzungsber. kais. Akad. Wissensch. Wien,' cviii. 1899.

Eder and Valenta, 'Denkschr. kais. Akad. Wissensch. Wien,' lxxviii. 1899.

Cornu, 'C. R.,' c. 1885, p. 1181.

Wave-length		Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek	Eder and Valenta			$\lambda +$	$\frac{1}{\lambda} -$	
3775·89		20r	3775·87 K. and R.	1·04	7·4	26476·4
3529·54		10	3529·58 "	0·98	8·0	28324·3
19·35		20r	19·39 "	"	"	406·3
13·42		1n	"	"	"	454·3
3456·50		2n	"	"	8·1	922·9
3229·90		2b	3229·88 "	0·91	8·8	30955·7

THALLIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length		Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek	Eder and Valenta			$\lambda +$	$\frac{1}{\lambda} -$	
3091.88		1b		0.88	9.2	32333.6
2921.7		1b	2921.63 K. and R.	0.83	9.8	34216.8
18.47		1n	18.43	"	9.9	254.6
2768.00	2768.00	6nr	2767.97	0.79	10.5	36116.7
	2740.01	3nr	"	"	"	485.6
	34.08	1n	"	0.78	"	564.8
	18.08	$\frac{1}{2}n$	"	"	10.7	780.0
	10.90	4b	2710.77	"	"	877.4
2709.3	09.34	3br	09.33	"	"	899.2
	00.34	2n	00.3	"	10.8	37021.6
	2670.97	1	"	0.77	10.9	428.5
	69.90	2n	"	"	"	443.6
2665.8	65.74	3n	2665.67	"	"	502.2
	14.22	1s	09.86	0.76	11.0	38241.3
	09.14	2	09.08	"	"	315.9
	2585.90	1n	2585.68	0.75	11.3	658.7
2580.30	80.29	3nr	80.23	"	"	743.9
	44.33	1	"	0.74	11.5	39291.6
2530.94	30.89	5b	"	"	"	515.8
	13.58	1	"	0.73	11.6	772.3
	2478.67 Fe	4	"	"	11.8	40332.4
	69.27	5	"	0.72	11.9	485.9
2452.04	52.04	4n	"	"	12.0	770.4
	45.61	2	"	"	"	877.6
	33.65	1n	"	"	12.1	41078.5
	2394.72	3s	"	0.71	12.4	746.2
	79.68	10r	2379.66	"	12.5	42010.0
	65.00	3	"	0.70	12.6	270.6
	62.30	$\frac{1}{2}n$	2362.16	"	"	319.0
	41.82	$\frac{1}{2}$	"	"	12.7	689.1
	16.14	4	2316.01	0.69	12.9	43162.4
	10.50	$\frac{1}{2}$	"	"	13.0	267.7
2298.25	2298.25	7s	"	"	13.1	498.3
	88.07	2	"	"	13.2	691.8
	85.95	1	"	"	"	732.3
	65.05	3s	"	0.68	13.3	44135.8
	37.83	3r	2237.91	"	13.6	652.5
	30.3	1n	"	"	"	823.4
	15.9	$\frac{1}{2}$	"	0.67	13.8	45114.6
	10.79	3	2210.80	"	"	218.9
	09.9	1n	"	"	"	237.1
	07.21	2b	2207.13	"	"	292.3
	03.79	1	"	"	"	362.6
	2144.50	1	"	0.66	14.4	46616.5
	39.44	3	"	"	"	726.8
Cornu						
2119.2				0.65	14.6	47173.0
05.1				"	14.8	470.8
2098.5				"	"	615.6
88.8				"	14.9	859.7
83.2				"	15.0	988.1
77.3				"	"	48124.4
72.4				0.64	15.1	238.1
69.2	2069.80	1		"	"	312.8
62.3				"	15.2	474.4

THALLIUM (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length		Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
Exner and Haschek	Eder and Valenta			$\lambda +$	$\frac{1}{\lambda}$	
57.3				0.64	15.2	592.4
53.9				"	15.3	672.6
	1964.80	1		0.62	16.2	50879.5
	1868.48	1		"	17.4	53502.1
	62.70	1		"	"	668.1

## POTASSIUM (OXYHYDROGEN FLAME SPECTRUM).

Ramage, 'Proc. Royal Soc.' lxx. 1902, p. 303.

Wave-length	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
7697	10 P1	7701.92 Lehmann	2.08	3.5	12988.6
64	10 P1	7668.54 "	"	"	13044.5
6939	8 B3	6938.8 Kayser and Runge	1.88	3.9	14407
13	7 B3	11.2 "	18.7	"	462
5832.25	6 A4	5832.23 "	1.59	4.7	17141.3
12.53	5 A4	12.54 "	1.58	"	199.5
02.12	7 B4	02.01 "	"	"	230.8
5782.74	6 B4	5782.67 "	"	4.9	288.1
5359.96	4 A5	5359.88 "	1.46	5.1	18651.8
43.38	2 A5	43.35 "	"	"	709.6
40.17	3 B5	40.08 "	"	"	720.9
23.68	2 B5	23.55 "	1.45	"	778.9
5112.76	2 A6	5112.68 "	1.40	5.4	19553.1
5099.83	1 B6	5099.64 "	1.39	"	602.7
97.64	1 A6	97.75 "	"	"	611.1
85.07	1 B6	84.49 "	"	"	659.4
4965.61	1 A7	4965.5 "	"	"	20132.5
57	1 B7	56.8 "	1.38	"	167
51.46	1 A7	52.2 "	"	"	190.1
4870	1 A8	4870.8 Liveing and Dewar	"	"	528
62	1 B8	63.8 "	"	"	562
57	1 A8	56.8 "	"	"	383
29	1	"	"	"	702
03	1 A9	03.8 "	"	"	814
01	1 B9	"	"	"	823
4798	1	4796.8 "	"	"	836
67	1	"	"	"	972
60	1 A10	59.8 "	"	"	21002
4642.35	2	4642 Hartley and Ramage	"	"	534.4
38.6	1		"	"	551.8
4047.39	9 P2	4047.36 Kayser and Runge	1.11	7.0	24700.3
44.33	10 P2	44.29 "	"	"	719.0
3447.56	3 P3	3447.49 "	0.96	8.2	28997.8
46.55	4 P3	46.49 "	"	"	29006.3
Present	1 P4	3217.76 "	"	"	31068.7
3217.36	2 P4	17.27 "	0.90	8.8	072.7

The lines of the principal series are marked 'P,' those of the first subordinate series 'A,' and those of the second subordinate series 'B.'

## RUBIDIUM (OXYHYDROGEN FLAME SPECTRUM).

Ramage, 'Proc. Royal Soc.' lxx. p. 305.

Wave-length	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
	P1	7950·46 Lehmann	2·15	4·3	
7799	10 P1	7805·98 "	2·11	"	
6306·8	1		1·71	"	15851·3
6299·19	9 A4	6298·7 Kayser and Runge	"	"	870·5
06·74	8 A4	06·7 " "	1·69	4·4	16106·8
6160·04	5 B4	6159·8 " "	1·68	"	228·9
6071·04	4 B4	6071·2 " "	1·65	4·5	466·8
5724·62	8 A5	5724·41 " "	1·56	4·7	17463·2
*5654·16	3 B5	5654·22 " "	1·54	4·8	680·9
48·19	7 A5	48·18 " "	"	"	699·6
*5579·3	2 B5		1·52	4·9	918·1
5432·05	6 A6	5431·83 " "	1·48	5·1	18403·9
*5391·3	1 B6		1·47	"	543·0
63·15	5 A6	5362·94 " "	"	"	640·3
* 22·83	1 B6		1·45	"	781·5
5260·51	4 A7	5259·8 " "	1·44	5·2	19004·0
* 34·6	1 B7		1·43	"	098
5195·76	3 A7	5194·8 " "	1·42	5·3	240·7
* 65·35	2		"	"	354·1
* 51·20	2 A8		1·41	"	407·2
* 32	1 B8		1·40	"	480
*5089·5	1 A8		1·39	5·4	642·5
* 76·3	1 A9		"	"	693·6
37	1		1·38	"	847
* 23	1 A10	5021·8 " "	1·37	5·5	902
* 17	1 A9		"	"	926
*4983	1 A11		1·36	"	20062
* 67	1		"	"	127
4215·68	9 P2	4215·72 " "	1·15	6·6	23714·4
02·04	10 P2	01·98 " "	"	"	791·4
3591·86	3 P3	3591·74 " "	1·00	7·9	27832·8
87·27	4 P3		"	"	868·4
3350·98	1 P4	3351·03 " "	0·94	8·5	29833·5
48·84	2 P4	48·86 " "	"	"	852·6
3229·26	1 P5		0·91	8·8	30958·0
28·18	1 P5		"	"	968·4

\* Observed also by Konen and Hagenbach, who give also 4953, 4926, and 4892.

Konen and Hagenbach (*Physikal. Zeitschr.* No. 27, 1903) give four new lines of Lithium at 6240·8, 4636·14, 4149·1 and 3934.



## CÆSIUM (OXYHYDROGEN FLAME SPECTRUM).

Ramage, 'Proc. Royal Soc.' lxx. 1902, p. 304.

Wave-length	Intensity and Character	Previous Observations	Reduction to Vacuum		Oscillation Frequency in Vacuum
			$\lambda +$	$\frac{1}{\lambda} -$	
6984	6		1.90	3.9	14314
74	9 A4	6973.9 Kayser and Runge	1.89	"	335
6869	2		1.86	"	554
29	2			4.0	639
6722	9 A4	6723.6 " "	1.83	"	873
6630	2		1.81	4.1	15079
6590	8 B4		1.79	"	171
6472	2		1.76	4.2	447
33	2		1.75	"	540
6354	8 B4		1.73	4.3	733
6217.6	2		1.69	4.4	16078.7
13.33	8 A5	6213.4 " "	"	"	089.7
6034.43	4 B5		1.64	4.8	566.7
10.59	8 A5	6010.6 " "	"	"	632.4
5847.86	2		1.59	"	17095.6
45.31	8 A6	5845.1 " "	"	"	102.7
39.33	2 B5		"	"	120.2
5746.37	1 B6		1.57	"	397.2
5664.14	7 A6	5664.0 " "	1.54	"	649.7
35.44	5 A7	35.1 " "	"	"	739.6
5574.4	1 B7	5573.1 Lecoq de Boisbandran {	1.52	4.9	933.9
68.9	1 B6		"	"	951.6
03.1	3 A8	01.9? " "	1.50	5.0	18166.2
5466.1	4 A7	5465.8 Kayser and Runge	1.49	"	289.2
14.4	1 A9		1.48	"	463.8
07.5	1 B7		"	"	487.3
5351	1 A10		1.46	5.1	682
41.15	3 A8		"	"	717.0
04	1 A11		1.45	"	848
5256.96	1 A9	5257.8 Lecoq de Boisbandran	"	5.2	19016.8
09	1		1.42	"	192
5199	1 A10		"	5.3	228
54	1 A11		"	"	396
4593.30	8 P2	4593.34 Kayser and Runge	1.26	6.0	21764.8
55.46	10 P2	55.44 " "	1.25	"	945.6
3888.75	2 P3	3888.83 " "	1.07	7.3	25707.9
76.31	4 P3	76.73 " "	"	"	790.4
3617.49	1 P4	3617.08 " "	1.01	7.8	27635.7
11.70	2 P4	11.84 " "	1.00	"	680.0
3477.25	1 P5		0.97	8.1	28750.3
3398.40	1 P6		0.95	8.3	29417.3
48.72	1 P7		0.94	"	853.7
14	1 P8		0.93	8.6	30166
3287	1 P9		0.92	8.7	414

Konen and Hagenbach have observed all the lines in the above list below 5750, except 5209, which they think does not belong to Cæsium.

## ANTIMONY (ULTRA-VIOLET SPARK SPECTRUM).

Eder and Valenta, 'Denkschr. kais. Akad. Wissensch. Wien,' lxxviii., 1899.

Exner and Haschek, 'Sitzungsber. kais. Akad. Wien,' cvi. 1897.

Wave-length		Intensity and Character	Previous Observations Kayser and Runge (Arc)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek			$\lambda +$	$\frac{1}{\lambda} -$	
	4693.2	2b		1.29	5.9	21301.9
	58.0	1n		1.28	"	462.5
	47.8	1n		1.27	"	509.6
	23.5	1b		"	6.0	622.6
	4599.6	1b		1.26	"	735.0
	91.9	4b		"	"	771.5
	44.8	1		1.25	6.1	996.1
	26.0	1b		1.24	"	22088.5
	06.8	1n		"	"	183.6
	4499.0	1n		1.23	"	221.1
	57.8	1b		1.22	6.2	426.4
	33.0	1b		"	"	551.9
	28.6	1b		1.21	6.3	574.2
	25.5	1b		"	"	590.0
	11.7	1b		"	"	660.5
	4378.0	2b		1.24	"	835.1
	67.0	1b		"	6.4	892.6
	52.4	10b		1.19	"	971.4
	15.0	4b		1.18	"	23168.9
	4260.3	8b		1.17	6.5	466.0
	59.5	1b		"	"	470.4
	30.0	1b		1.16	6.6	634.0
	26.9	1 Ca		"	"	651.4
	24.5	1b		"	"	664.8
	19.2	6n		"	"	694.6
	01.1	1b		1.15	"	792.1
	4195.3	4b		"	6.7	829.5
	71.0	1b		"	"	968.4
	40.7	2b		1.14	6.8	24142.0
	34.0	2b		"	"	182.8
	4058.0	6 (Pb)		1.12	6.9	635.8
	40.6	1b		1.11	7.0	739.3
	33.71	8	4033.70	"	"	784.0
	24.8	1b		"	"	838.8
	3986.1	2n		1.10	7.1	25080.2
	68.6	2 Ca		1.09	"	188.2
	64.8	2n		"	"	214.9
	60.8	4b		"	"	240.1
	33.8	2 Ca		1.08	7.2	413.5
	33.7	2b		"	"	414.2
	32.0	1n		"	"	425.2
	08.8	1b		"	7.3	576.0
	3883.3	1n		1.07	"	744.0
	50.4	6b		1.06	"	964.0
	41.4	6b		"	"	26024.9
	3772.9	2b		1.04	7.5	497.3
	66.6	1n		"	"	541.6
	54.8	1		"	"	625.1
	39.5	8b		"	"	724.0
	22.93	8	3722.92	1.03	7.6	853.0
	3692.0	1b		1.02	"	27078.0
	87.0	2b		"	"	114.7

ANTIMONY (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length		Intensity and Character	Previous Observations Kayser and Runge (Arc)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek			$\lambda +$	$\frac{1}{\lambda}$	
	3683.7	2 Pb		1.02	7.7	27138.9
	77.8	1		"	"	182.5
	75.6	1b		"	"	198.7
	68.0	1b		"	"	255.1
	55.5	1n		1.01	"	348.3
	52.0	6n		"	"	374.6
	39.8	1		"	"	466.3
	38.01	8	3637.94	"	7.8	479.8
	36.8	1		"	"	488.9
	30.0	4b		"	"	540.4
	27.5	1n		"	"	559.4
	3597.7	8b		1.00	"	787.7
	66.7	8b		0.99	7.9	28029.2
	59.5	8b		"	"	085.9
	34.0	4b		0.98	8.0	288.5
	19.7	4b		"	"	403.5
	04.8	10b		"	8.1	524.2
	3498.6	8b		0.97	"	574.8
	74.0	8b		"	"	777.2
	59.5	1b		"	8.2	897.7
	52.0	1b		0.96	"	960.5
	25.9	4b		"	8.3	29181.1
	14.7	1n		0.95	"	276.8
	03.9	2b		"	"	369.8
	00.0	1n		"	"	403.5
	3396.0	1b		"	8.4	438.0
	93.8	1b		"	"	457.1
	90.6	1b		"	"	484.9
	83.2	6	3383.24	"	"	544.2
	77.5	1b		0.94	"	599.3
	74.8	1b		"	"	614.2
	67.2	1b		"	"	689.9
	55.0	1b		"	8.5	797.8
	37.3	4b		"	"	955.8
	12.8	1n		0.93	8.6	30177.3
	04.3	2b		"	"	255.0
	3288.3	1n		0.92	8.7	402.2
	85.8	1b		"	"	425.3
	78.7	1b		"	"	491.2
	76.7	1b		"	"	509.8
	74.1	2		"	"	534.0
	67.62	10	3267.60	"	"	595.1
	55.4	1		0.91	"	709.5
	52.2	1		"	8.8	739.6
	47.7	1		"	"	782.2
	41.2	8b		"	"	844.0
	32.65	10	32.61	"	"	925.6
	3197.4	1b		0.90	8.9	31266.5
	93.7	1n		"	"	302.7
	92.8	1n		"	"	311.6
	75.2	1n		0.89	9.0	485.1
	69.4	1b		"	"	542.7
	48.2	1b		"	"	755.2
	3087.2	1b		0.87	9.2	32382.6
	67.9	1		"	9.3	586.3

ANTIMONY (ULTRA-VIOLET SPARK SPECTRUM)—*continued*.

Wave-length		Intensity and Character	Previous Observations Kayser and Runge (Arc)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek			$\lambda +$	$\frac{1}{\lambda} -$	
	3040.7	8b		0.86	9.4	32877.8
	29.90	10	3029.91	"	"	995.0
	24.8	1		"	9.5	33050.5
	22.1	2b		0.85	"	079.7
	10.1	2b		"	"	212.0
	2981.2	8n		"	9.6	533.9
	66.4	6b		0.84	9.7	701.3
	23.5	1b		0.83	9.8	34195.8
	13.53	8n		"	9.9	313.4
	2895.7	1b		0.82	"	524.1
	91.7	4b		"	10.0	571.7
	90.0	2b		"	"	592.1
	87.7	1b		"	"	619.6
	86.0	1b		"	"	640.0
	84.0	1b		"	"	664.1
	80.0	2b		"	"	712.2
	78.05	10	2878.01	"	"	735.7
	63.1	1b		0.81	10.1	917.1
	58.1	1		"	"	978.3
	57.2	1n		"	"	989.3
	53.3	1n		"	"	35037.0
	51.20	8	51.20	"	"	062.8
	37.5	1b		"	10.2	232.1
	33.1	1		"	"	286.8
	26.9	2b		"	"	361.6
	19.0	1b		0.80	10.3	463.3
	13.3	1n		"	"	535.1
2806.80		10n		"	"	617.5
	02.0			"	"	678.4
	2797.9	1b		"	10.4	730.7
	95.7	1		"	"	758.8
	90.57	8n		"	"	824.6
	86.2	1n		"	"	880.8
	75.8	1b		0.79	"	36015.2
2769.97	70.08	8s	2770.04	"	10.5	089.8
	64.8	1b		"	"	178.5
	62.2	1n		"	"	198.5
	41.2	1n		0.78	10.6	469.8
27.37	27.3	3	27.32	"	"	655.7
19.05	19.00	8s	19.00	"	10.7	767.2
06.73		1		"	"	934.2
2692.43	2692.3	3	2692.35	0.77	"	37132.1
82.98	82.8	5	82.86	"	10.8	275.1
70.81	70.7	5n	70.73	"	10.9	430.9
69.79	69.6	5n		"	"	445.2
63.31		1s		"	"	536.4
57.03	56.8	1b		"	"	625.1
52.73	52.70	7	52.70	0.76	11.0	686.2
	32.6	1n		"	"	974.3
17.46	17.5	3n		"	11.1	38193.3
14.78	14.8	1s	14.74	"	"	233.1
14.33		2		"	"	238.6
12.43	12.4	5	12.40	"	"	267.5
2598.24	2598.15	9r	2598.16	0.75	11.2	477.1
90.42	90.4	5b		"	"	592.6



ANTIMONY (ULTRA-VIOLET SPARK SPECTRUM)—*continued.*

Wave-length		Intensity and Character	Previous Observations Kayser and Runge (Arc)	Reduction to Vacuum		Oscillation Frequency in Vacuo
Eder and Valenta	Exner and Haschek			$\lambda +$	$\frac{1}{\lambda} -$	
	2586.8	1n		0.75	11.3	88646.5
2574.24	74.1	3s	74.14	"	"	832.8
71.64	71.6	1n		"	"	874.4
	70.6	1n		"	"	890.1
67.87	67.8	1s		"	11.4	931.4
65.62	65.6	3b		"	"	965.5
	57.6	1b		0.74	"	39087.8
54.81	54.8	1s	54.72	"	"	130.4
44.10	43.9	3n		"	11.5	310.6
28.68	28.62	9r	28.60	"	11.6	535.2
28.58		1		"	"	536.3
	22.9	1		"	"	625.3
20.30	20.3	1n		"	"	666.2
	14.5	1n	14.64	0.73	"	757.7
10.66	10.6	1	10.60	"	11.7	818.8
	07.8	1n		"	"	863.9
	2488.3	1		"	11.8	40176.3
	83.3	1		"	"	257.2
	81.8	1	2481.81	"	"	281.5
2480.55	80.5	2	80.50	"	"	301.8
78.45	78.4	4.		"	"	336.0
74.80	74.6	1	74.63	"	11.9	395.4
45.66	45.7	5	45.59	0.72	12.0	876.7
29.55		1		"	"	41147.7
26.52	26.5	2s	26.44	"	12.2	199.1
22.31	22.2	2s	22.21	"	"	270.7
2395.35	2395.4	1n	2395.31	0.71	12.4	735.2
83.77	83.8	2n	83.71	"	"	938.0
73.84		3 Fe	73.78	0.70	12.5	42113.3
	61.2	1n		"	"	337.7
60.58	60.6	1	60.60	"	"	349.9
16.02		3		0.69	12.9	43164.8
11.71	11.8	4	11.60	"	13.0	245.0
11.47				"	"	249.5
06.56	06.6	2n	06.56	"	"	341.6
2295.99		1		"	13.1	526.9
93.48	93.5	2s	2293.54	"	"	588.8
88.99	89.1	1	89.09	"	"	674.3
62.51		3	62.55	0.68	13.4	44185.3
46.97		1		"	13.5	490.9
24.92		3	25.06	0.67	13.7	931.7
22.02		1	22.10	"	"	990.4
20.70		3	20.85	"	"	45017.1
08.48		4	08.65	"	13.8	266.2
03.59		2	03.83	"	13.9	366.6
01.36		1	01.46	"	"	412.6
2179.23		4	2178.33	0.66	14.1	873.9
75.90		4	75.99	"	"	943.9
70.13		3		"	14.2	46066.1
44.99		4	45.10	"	14.4	605.9
41.76		1	41.76	"	"	676.2
39.75		3	39.89	"	"	720.0
18.57		1		0.65	14.6	47187.1
2098.47		1	2098.47	"	14.8	639.0

## ARSENIC (SPARK SPECTRUM).

Exner and Haschek, 'Sitzungsber. kais. Akad. Wissensch. Wien,' ex. 1901.

Wave-length	Intensity and Character	Previous Observations Kayser and Runge (Arc)	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4540.0	2b		1.24	6.1	22020.3
4495.5	2b		1.23	"	238.4
66.6	1b		"	6.2	382.2
4368.50	1n		1.20	"	885.0
4229.5	1b		1.16	6.6	23636.8
08.1	1b		"	"	757.1
4197.8	1b		1.15	6.7	815.3
88.80	2		"	"	871.0
4082.8	1b		1.12	6.9	24486.1
64.55	1n		"	"	596.1
37.18	30		1.11	7.0	762.8
3948.85	1b		1.09	7.2	25316.6
31.4	1b		1.08	"	429.0
22.60	100		"	"	486.3
3545.75	1n		0.99	8.0	28194.8
3256.0	2n		0.91	8.7	30703.8
3119.70	1n	3119.69	0.88	9.1	32045.3
16.7	2b		"	"	076.1
3032.97	1	3032.96	0.86	9.4	961.6
2991.2	1n	2991.11	"	9.6	33415.1
59.8	3b		0.84	9.7	478.4
26.3	1b		"	9.8	34158.4
2898.86	2	2898.83	0.81	9.9	485.4
60.60	8	60.54	"	10.1	947.6
43.80	2n		"	10.2	35154.0
31.0	1b		"	"	313.0
2780.37	10	2780.30	0.79	10.4	956.0
45.10	5	45.09	"	10.6	36417.9
2493.07	4	2492.98	0.73	11.8	40099.4
56.62	4	56.61	0.72	12.0	694.3
37.30	1	37.30	"	12.1	41016.9
2381.32	2n	2381.28	0.71	12.5	978.0
70.87	3	70.85	0.70	"	42166.1
69.75	3	69.75	"	"	186.0
63.10	1n	63.12	"	12.6	304.6
50.02	10	49.92	"	12.7	558.3
2288.23	3n	2288.19	0.69	13.2	43688.7
71.53	1n	71.46	1.68	13.3	44009.9
66.82	1n	66.79	"	"	101.4
29.96	1		0.67	13.6	830.2
2192.21	2n		"	13.9	45602.2
65.53	2n	2165.64	0.66	14.2	46163.9
56.3	1n		"	14.3	361.4
34.37	1		"	14.5	837.7

## RADIUM (SPARK SPECTRUM).

Runge and Precht, 'Ann. d. Phys.,' xii. p. 407, 1903. .

Wave-length	Intensity	Wave-length	Intensity
5813·85	10	4682·359	50
5660·81	10	4533 327	10
5616·73	8	4436·489	20
5502·07	8	4340·830	50
5406·78	8	3814 578	100
5400·31	8	3649·748	50
4856·25	8	2813·836	10
4826·118	10	2709·045	8

NOTE.—Several other weaker lines were observed.

# APPENDIX P.

## RUTHENIUM.

Kayser, 'Königl. Preuss. Akad. Wissensch. Berlin,' 1897.

Adeney, 'Proc. Royal Dublin Soc.' vol. x. (n.s.), pt. 1, No. 3.

Exner and Haschek, 'Sitzungsber. kais. Akad. Wissensch. Wien,' cv. 1896, cvi. 1897.

Rowland and Tatnall, 'Astro.-phys. Journ.' vol. iii. p. 288, 1896.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
5887.371			0	1.60	4.6	16980.9
64.830			0	"	"	17046.2
33.561			0n	1.59	4.7	17137.5
33.380			2	"	"	38.0
28.580			1	"	"	52.1
28.235			2	"	"	53.1
26.018			0	"	"	59.5
15.157			5	1.58	"	91.7
04.461			4	"	"	17223.4
5792.382			1	"	"	59.3
90.741			1	"	"	64.2
82.720			4	"	"	88.2
82.611			2	"	"	88.8
74.533			2	1.57	"	17312.7
71.352			0	"	"	22.3
68.066			3	"	"	32.1
58.875			0	"	"	59.8
56.980			3	"	"	66.1
53.772			1	"	"	75.2
52.163			3	"	"	80.0
47.623			5	"	"	93.8
46.131			4	"	"	98.2
45.776			1	"	"	99.4
40.710			0	"	"	17414.7
34.606			0	1.56	"	33.3
30.122			2	"	"	46.7
25.895			4	"	"	59.8
24.975			4	"	"	62.6
14.391			2	"	4.8	93.9
13.025			4	"	"	99.1
02.522			4	1.55	"	17531.3
5699.741			2	"	"	39.9
99.224			9	"	"	41.5
96.526			1	"	"	49.8
94.626			2	"	"	55.6
93.190			4	"	"	60.1
92.288			1	"	"	62.8
88.990			2	"	"	73.0



RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
5679.790			4	1.55	4.8	17601.5
76.720			1	"	"	11.0
65.370			4	1.54	"	46.3
63.233			0	"	"	52.9
57.127			2	"	"	72.0
53.482			2	"	"	83.4
53.005			0	"	"	84.9
50.981			2	"	"	91.2
49.737			3	"	"	95.1
48.058			1	"	"	17700.4
47.755			0	"	"	01.3
41.848			2	"	"	20.3
36.441			7	"	"	36.9
29.984			1	"	"	57.2
27.722			2	1.53	"	64.4
19.558			0	"	"	90.2
09.360			2	"	4.9	17822.4
06.958			3	"	"	31.1
03.782			3	"	"	36.2
03.370			2	"	"	41.5
00.753			2	"	"	49.8
5582.501			2	1.52	"	17908.2
79.650			2	"	"	17.4
78.914			2	"	"	19.7
78.594			4	"	"	20.8
70.906			2	"	"	45.5
69.233			4	"	"	50.9
59.962			6	"	"	80.8
56.719			3	"	"	91.3
49.960			2	1.51	"	18013.2
40.881			3	"	"	42.8
31.220			2	"	"	74.2
18.056			2	"	"	18117.4
12.593			2	1.50	"	35.4
10.934			6	"	"	42.8
07.151			0	"	"	53.3
01.230			1	"	5.0	72.7
5496.899			4	"	"	90.4
94.575			1	"	"	95.0
84.850			2	"	"	18227.0
84.524			6	"	"	28.1
80.507			3	"	"	41.5
79.619			4	"	"	44.3
75.377			2	1.49	"	58.6
73.050			2	"	"	66.3
71.755			0	"	"	70.7
56.329			2n	"	"	18322.3
55.018			6	"	"	26.7
52.930			1	"	"	33.8
39.618			2n	1.48	"	78.6
39.421			2	"	"	79.3
27.815			4	"	"	18418.6
19.056			4	"	"	48.4
01.609			2	1.47	5.1	18507.9
01.234			5	"	"	09.2
5386.083			4	"	"	61.2

RUTHENIUM—*continued*.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
5378.042			3	1.47	5.1	18589.0
73.505			0n	"	"	18604.7
65.799			2	"	"	31.5
62.271			2	1.46	"	43.7
61.967			5	"	"	44.8
48.340			0	"	"	92.3
36.110			3	"	"	18735.1
34.901			2n	"	"	39.4
33.114			3	"	"	45.7
15.520			2	1.45	"	18807.7
09.440			4	"	"	29.3
07.481			0	"	"	37.2
06.624			1	"	"	39.3
06.035			0	"	"	41.4
05.030			4	"	"	44.9
5291.327			1	"	5.2	93.6
84.256			4	1.44	"	18918.9
80.989			2	"	"	30.6
75.240			1	"	"	51.2
66.988			1	"	"	81.0
66.642			1	"	"	82.2
64.113			0n	"	"	91.3
57.240			2	"	"	19016.1
51.816			1	"	"	35.8
45.612			2	1.43	"	58.3
45.112			0	"	"	60.2
43.109			2n	"	"	67.4
42.560			1	"	"	69.4
35.774			1	"	"	94.4
23.708			3	"	"	19138.1
14.247			1	"	"	72.8
13.586			3	"	"	75.2
09.667			2	1.42	"	89.9
02.285			2	"	5.3	19217.0
00.040			3	"	"	25.3
5195.171			4	"	"	43.3
76.361			0	"	"	19313.3
74.105			0	1.41	"	21.7
71.193			6	"	"	32.5
69.242			0	"	"	39.8
68.793			0	"	"	41.6
68.237			0	"	"	43.6
60.167			2	"	"	73.9
55.302			4	"	"	92.2
53.364			2	"	"	99.5
51.230			4	"	"	19407.5
47.401			4	"	"	22.0
42.933			4	"	"	44.2
36.717			5	1.40	"	62.4
34.285			0	"	"	71.6
34.059			2	"	"	72.5
27.423			2	"	"	97.7
07.230			4	"	5.4	19574.7
01.892			0	"	"	95.2
01.553			2	"	"	96.5
5093.996			4	1.39	"	19625.6

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
5077.484			3	1.39	5.4	19689.4
77.243			1	"	"	90.3
73.141			2	"	"	19706.2
62.815			1	1.38	"	46.5
57.487			4	"	"	67.3
53.114			0	"	"	84.4
47.471			2	"	"	19806.5
45.570			1	"	"	14.0
41.528			0	"	"	29.9
40.908			1	"	"	32.3
40.521			1	"	"	33.8
39.794			0n	"	"	36.7
26.343			3	1.37	5.5	89.7
20.472			0	"	"	19912.9
19.140			1	"	"	18.2
11.387			3	"	"	49.0
10.765			1	"	"	51.5
05.394			1	"	"	73.0
03.697			0	"	"	79.7
4992.891			2	"	"	20023.0
87.412			1	1.36	"	45.0
80.498			2	"	"	72.8
76.351			2	"	"	89.5
75.534			0	"	"	92.8
74.255			0	"	"	98.0
69.055			2	"	"	20119.0
60.022			0	"	"	56.7
55.416			1	"	"	74.4
38.687			3	1.35	5.6	20243.1
35.805			0	"	"	54.5
21.233			4	"	"	20314.4
11.755			1	1.34	"	53.7
10.384			0	"	"	59.4
08.045			3	"	"	69.1
05.179			1	"	"	83.0
03.223			5	"	"	89.2
02.033			0	"	"	94.1
01.234			0	"	"	97.4
4899.416			1	"	"	20405.0
95.745			4	"	"	20.3
95.555			1	"	"	21.1
95.474			1	"	"	21.4
85.186			0	"	"	64.5
82.832			0	"	"	81.1
77.598			0	1.33	"	96.3
75.188			0	"	"	20506.4
74.489			0	"	"	09.4
69.952			1	"	"	28.5
69.314			6	"	"	31.2
65.253			1	"	"	48.3
63.265			0	"	"	56.7
62.024			2	"	5.7	62.1
54.731			1	"	"	92.8
44.720			4	"	"	20635.3
39.930			1	1.32	"	55.8
39.174			3	"	"	49.0

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		+ $\lambda$	$\frac{1}{\lambda}$ —	
4833.157			2	1.32	5.7	20644.7
28.865			0	"	"	20703.1
22.738			0	"	"	29.4
17.512			1	"	"	51.9
15.694			5	"	"	59.7
14.895			0	"	"	63.2
13.412			0	"	"	70.6
06.375			0	"	"	20800.0
05.043			2	"	"	05.8
01.343			1	1.31	"	21.8
4798.607			2	"	"	33.7
95.721			2	"	"	46.3
94.547			2	"	"	51.3
81.937			1	"	5.8	20906.3
74.168			0	"	"	40.2
73.325			0	"	"	43.9
69.464			4	"	"	61.2
67.315			0	"	"	70.4
64.582			0	1.30	"	72.4
58.043			6	"	"	21011.2
56.402			2	"	"	18.5
53.280			0	"	"	32.2
51.197			0	"	"	41.5
43.205			1	"	"	77.0
38.587			0	"	"	97.5
33.710			4	"	"	21119.3
33.486			0	"	"	20.3
31.504			3	"	"	29.1
21.078			1	1.29	"	75.8
18.228			0	"	"	88.6
16.201			2	"	"	97.5
14.335			0	"	"	21206.1
12.146			1	"	"	15.9
09.672		4709.55	6	"	"	27.1
		04.2	1	"	"	
		02.6	1	"	"	
		4692.3	1	1.28	"	
4690.284		90.5	4	"	5.9	21314.7
		87.3	1	"	"	
85.947		86.2	1	"	"	34.5
84.196		84.4	4	"	"	42.4
83.253			0	"	"	46.7
81.966		82.2	4	"	"	52.6
81.563			0	"	"	54.5
		77.5	1n	"	"	
74.821		75.0	4	"	"	85.3
		74.0	1n	"	"	
70.146		70.4	4	"	"	21407.0
		69.5	1	"	"	
		68.5	1n	"	"	
		67.5	1n	"	"	
62.663			0	"	"	41.1
54.901			0	1.27	"	76.8
54.489		54.6	4	"	"	78.7
52.371			0	"	"	88.5
48.293			0	"	"	21507.4



RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
4647.787		4647.68	5	1.27	5.9	21509.7
46.967			0	"	"	14.9
46.326			0	"	"	16.5
45.264		45.4	4	"	"	21.4
42.752			1	"	"	33.1
42.548			1	"	"	34.1
41.135		41.2	0	"	"	40.5
39.490		39.1	0	"	"	48.2
38.569			0	"	"	52.5
35.849		36.0	4	"	"	65.1
28.495			0	"	6.0	98.8
26.184			1	"	"	21610.1
17.827			0	1.26	"	49.2
		12.5	1	"	"	
		10.6	1n	"	"	
		09.5	1n	"	"	
05.833		05.8	2	"	"	21705.6
02.978			0	"	"	20.1
01.933		01.9	3	"	"	26.8
*4599.271		4599.30	6	"	"	36.6
96.879		97.1	4	"	"	47.9
93.367			0	"	"	64.5
93.161			0	"	"	65.4
* 92.695		92.7	4	"	"	67.7
91.717			2	"	"	72.3
* 91.257		91.4	4	"	"	74.5
89.734			0	"	"	81.8
89.177			0	"	"	84.4
		85.5	1	"	"	
* 84.632		84.60	4	"	"	21806.0
		81.5	1n	"	"	
80.246		80.4	3	1.25	"	26.4
		74.2	1n	"	"	
64.862		65.0	2	"	6.1	21900.4
62.772		62.9	1	"	"	10.4
* 60.157	4560.16	60.3	4	"	"	22.9
59.215			1	"	"	27.5
		56.5	1n	"	"	
* 54.696	54.70	54.71	6r	"	"	49.3
* 52.281	52.28	52.5 Pt	4	"	"	60.9
* 50.112	50.11	50.3	3	"	"	71.4
49.589		49.6	2	"	"	73.9
* 48.030	48.03	48.2	4	"	"	81.4
* 47.463	47.46	47.6	4	"	"	84.2
47.105		47.3	2	"	"	85.9
		45.4	1n	"	"	
		44.0	1	"	"	
42.848	42.85	42.7	1	1.24	"	22013.1
		42.0	1n	"	"	
		41.4	1n	"	"	
	40.05	40.2	1n	"	"	20.1
		36.0	1n	"	"	
		35.0	1n	"	"	

\* Rowland and Tatnall: 4599.265, 4592.699, 4591.285, 4584.619, 4560.168, 4554.697, 4552.293, 4550.121, 4548.031, 4547.467.

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
4531·035	4531·04	4531·2	4	1·24	6·1	22063·9
25·616			0			90·3
* 21·110	21·11	21·3	4	"	"	22112·4
* 17·977	17·98	18·2	4	"	"	27·7
* 17·060	17·06	17·3	4	"	"	32·2
16·421	16·42	16·6	2	"	"	35·3
* 11·353	11·35	11·5	4	"	"	60·2
* 10·251	10·25	10·4	4	"	"	65·6
08·715	08·72	08·8	2	"	"	73·2
08·192		08·3	1	"	"	75·7
*4498·322	4498·32	4498·30	4	1·23	"	22219·4
91·846	91·85	92·1	2	"	6·2	56·4
90·396	90·40	90·5	2	"	"	63·5
88·550	88·50	88·7	4	"	"	72·7
82·194	82·19	82·3	2	"	"	22304·3
* 80·603	80·60	80·7	4	"	"	12·2
	79·80	79·7	1	"	"	16·3
75·493		75·7	2	"	"	37·7
* 74·093	74·09	74·2	4	"	"	44·7
71·200			0	"	"	59·2
	70·69	70·8	1	"	"	61·7
67·427		67·6	2	1·22	"	78·0
66·511			2	"	"	82·7
65·649	65·65		1	"	"	87·0
64·661	64·66		0	"	"	91·9
* 60·209	60·21	60·19	6	"	"	22414·3
		53·5	1n	"	"	
* 49·509	49·51	49·50	4	"	"	68·2
* 44·674	44·67	44·8	4	"	"	92·6
		43·3	1n	"	"	
40·245			0	"	"	22509·1
* 39·938	39·94	39·98	5	"	"	16·6
39·574			2	"	"	18·5
		38·6	1	"	"	
30·478			1	1·21	6·3	64·6
* 28·624		28·65	4	"	"	74·1
26·182	26·18		1	"	"	86·5
24·958		25·2	3	"	"	92·8
23·143		23·3	1	"	"	22602·0
* 21·629	21·63	21·7	4	"	"	09·8
21·006	21·01	21·2	4	"	"	13·0
20·634	20·63		2	"	"	14·9
14·607			2	"	"	45·7
13·458			2	"	"	51·6
12·058			0	"	"	58·8
* 10·207	10·21	10·17	6	"	"	68·4
		09·1	1n	"	"	
05·809		05·2	0	"	"	91·0
		02·7	1n	"	"	
4399·751	99·75	00·0	1	"	"	22722·3
* 97·956	97·96	4398·3	4	"	"	31·5
96·868			0	"	"	37·2

\* Rowland and Tatnall: 4521·124, 4517·985, 4517·063, 4511·364, 4510·265, 4498·316, 4480·617, 4474·100, 4460·194, 4449·509, 4444·681, 4439·935, 4428·631, 4421·626, 4410·193, 4397·966.

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
4395·125	4495·13	4395·4	2	1·21	6·3	22746·1
* 91·191	91·19	91·5	4	1·20	"	66·5
* 90·614	90·61	90·60	6	"	"	69·6
89·547		89·4	0	"	"	75·1
89·150			2	"	"	77·1
* 86·431	4386·43	86·6	4	"	"	91·3
		86·1	4	"	"	
* 85·823	85·82	85·85	5	"	"	94·4
* 85·563	85·56	85·60	5	"	"	95·8
* 83·530	83·53	83·7	2	"	"	22806·4
81·421	81·42	81·7	2	"	"	17·3
76·745		76·8	1	"	"	41·7
		73·9	1	"	"	
		73·4	1	"	"	
* 72·381	72·38	72·38	5	"	"	64·5
	71·52	71·6	2	"	"	68·8
* 71·363			4	"	"	69·9
70·580		70·9	2	"	"	74·0
65·741			0	"	6·4	99·2
64·270		64·6	2	"	"	22906·9
		63·5	1	"	"	
		63·2	1	"	"	20·3
* 61·581			2	"	"	21·0
* 61·372	61·37	61·40	5	"	"	22·1
		58·5	1 <sub>n</sub>	"	"	
57·031		57·6	1	"	"	45·0
* 54·960	54·96	55·2	3	1·19	"	55·9
* 54·300	54·30	54·32	6	"	"	59·4
50·632			0	"	"	78·8
* 49·868	49·86	49·90	5	"	"	82·8
* 46·640		46·9	4	"	"	99·9
43·178		43·7	0	"	"	23018·2
* 42·243	42·24	42·25	6	"	"	23·2
41·204		41·4	2	"	"	28·6
40·503		40·7	2	"	"	32·4
		40·0	1 <sub>n</sub>	"	"	
38·829		39·1	2	"	"	41·3
* 37·427	37·43	37·6	4	"	"	48·7
		37·3	1	"	"	
* 36·584	36·58	36·7	2	"	"	53·2
		33·1	1	"	"	
32·789		32·9	0	"	"	73·4
32·655	32·66		2	"	"	74·1
* 31·321	31·32	31·5	4	"	"	81·8
28·712		29·0	2	"	"	95·2
* 27·588	27·59	27·8	3	"	"	23101·2
27·489			2	"	"	01·7
* 26·987	26·99	27·2 Pt	4	"	"	04·4
* 25·215	25·22	25·4	4	"	"	13·8
23·626			0	"	"	22·3
23·120	23·15	23·3	2	"	"	25·0
21·450			2	"	"	34·0

\* Rowland and Tatnall: 4391·191, 4390·605, 4386·436, 4385·814, 4385·553, 4383·526, 4372·363, 4371·366, 4361·597, 4361·371, 4354·969, 4354·296, 4349·867, 4346·645, 4342·236, 4337·431, 4336·591, 4331·329, 4327·590, 4326·986, 4325·213.

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
4320.972		4321.0	0	1.19	6.4	23137.5
20.743			2	"	"	37.8
* 20.045	4320.04	20.08	5	"	"	41.4
19.274			2	"	"	45.6
* 18.596	18.60	18.7	4	1.18	"	49.3
* 16.792		17.0	2	"	"	59.0
15.219			4	"	"	67.4
* 14.468	14.47	14.6	4	"	"	71.4
13.067			0	"	"	79.0
12.632		12.8	2	"	"	81.3
12.047			0	"	"	84.4
		11.0	1	"	"	
09.361		09.6	2	"	"	98.9
08.567	08.57		0	"	6.5	23203.1
* 07.748	07.75	07.74	4	"	"	07.5
		06.2	1	"	"	
		05.0	1	"	"	
02.150			0	"	"	37.7
01.297		01.5	1	"	"	42.3
		4299.3	1	"	"	
* 4297.887	4297.89	97.92	8	"	"	60.8
96.860	96.86	97.1	2	"	"	66.3
* 96.090	96.09	96.05	5	"	"	70.4
* 94.955	94.96	94.95	5	"	"	76.6
94.268			4	"	"	80.3
* 93.441	93.44	93.48	4	"	"	84.8
92.419		92.6	0	"	"	90.4
90.692	90.69	90.9	2	"	"	99.8
* 87.209	87.21	87.4	4	"	"	23318.7
* 84.502	84.49	84.50	6	"	"	33.4
		83.4	ln	"	"	
* 82.357	82.36	82.6	2	"	"	35.1
* 82.093	82.09	82.3	2	"	"	46.6
		81.7	1	"	"	
		79.6	1	1.17	"	
* 78.842			2	"	"	64.0
* 77.415		77.6	2	"	"	72.1
73.115			0	"	"	95.6
		72.0	ln	"	"	
		67.0	0	"	"	
66.157				"	"	23433.8
* 65.766	65.77	65.9	2	"	"	37.0
63.551		63.7	2	"	"	48.1
60.166	60.17	60.3	3	"	"	66.7
* 59.152	59.15	59.20	5	"	"	72.3
		57.6		"	"	
56.790		57.0	0	"	"	85.4
56.049		56.1	0	"	"	89.5
55.868		55.7	1	"	"	90.5
48.304		48.5	2	"	6.6	23532.2
* 46.902	46.90	46.95	4	"	"	40.0
* 46.522	46.52	46.55	4	"	"	42.1

\* Rowland and Tatnall: 4320.036, 4318.599, 4316.801, 4314.471, 4307.746, 4297.870, 4296.090, 4294.948, 4293.443, 4287.204, 4284.490, 4282.367, 4282.089, 4278.844, 4277.413, 4265.762, 4259.144, 4246.893, 4246.498.



RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
4246·359			6	1·17	6·6	23543·0
* 44·997	4245·05	4245·2	4	"	"	50·5
* 43·228	43·23	43·20	6	1·16	"	60·3
* 41·231	41·23	41·25	6	"	"	71·4
40·194		40·4	0	"	"	76·9
		40·0	1	"	"	
		38·5	ln	"	"	
* 36·838	36·84	37·1	4	"	"	23604·0
		33·6	1	"	"	
* 32·478	32·48	32·6	4	"	"	20·2
		31·7	1	"	"	
* 30·470	30·20	30·48	6	"	"	31·4
* 29·472	29·47	29·6	4	"	"	37·1
		28·2	1	"	"	
* 26·825	26·82	27·0 Ca	0	"	"	
* 25·258	25·26	25·4	3	"	"	60·6
* 20·838	20·84	20·85	4	"	"	85·4
* 17·438	17·44	17·40	7	"	"	23705·5
* 14·610	14·61	14·60	4	"	"	20·4
		13·8	1	"	"	
* 12·240	12·24	12·20	5	"	"	33·7
		09·5	1	"	"	
* 07·797	07·80	08·0	2	"	"	58·8
* 06·178	06·18	06·20	4	"	"	67·9
		03·5	1	1·15	"	
		03·2	1	"	"	
* 00·069	00·07	00·05	7	"	6·7	23802·5
*4199·039	4199·04	4199·02	4	"	"	08·2
* 97·748	97·75	97·78	4	"	"	15·6
* 97·038	97·04	97·05	2	"	"	19·6
		95·0	1	"	"	
* 89·639		89·9	0	"	"	61·7
		88·6	ln	"	"	
		84·5	ln	"	"	
* 82·994		83·0	0	"	"	99·6
* 82·807			1	"	"	23900·7
* 82·621	82·62	82·8	2	"	"	01·7
* 75·615		75·8 Os	2	"	"	41·9
		75·3	2	"	"	
		74·5	ln	"	"	
		73·4	1	"	"	
		70·9	ln	"	"	
* 70·218	70·22	70·5	2	"	"	72·8
		69·3	1	"	"	
* 67·666	67·67	67·65	5	1·14	"	87·5
* 67·030	67·03	67·3	0	"	"	91·2
		65·1	ln	"	"	
		64·8	ln	"	"	
* 61·817	61·82	61·80	4	"	"	24021·3
		59·5	1	"	"	
		58·2	1	"	"	

\* Rowland and Tatnall: 4244·992, 4243·216, 4241·215, 4236·834, 4232·481, 4230·478, 4229·475, 4226·824, 4225·256, 4220·838, 4217·427, 4214·714, 4214·604, 4212·225, 4207·798, 4206·178, 4200·062, 4199·039, 4197·745, 4197·039, 4189·631, 4182·998, 4182·812, 4182·623, 4175·604, 4170·219, 4167·683, 4167·047, 4161·823.

## RUTHENIUM—continued.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
*4150·475	4150·48	4150·6	1	1·14	6·7	24086·9
* 48·530	48·53	48·7	1	„	6·8	98·1
* 46·956	46·96	46·92	4	„	„	24107·3
* 45·905	45·80	45·95	4	„	„	13·4
* 44·335		44·35	4	„	„	24·4
38·923			0	„	„	54·1
* 37·410	37·41	37·6	3	„	„	62·9
		35·8 Os	1	„	„	
		35·2	1	„	„	
		31·7	ln	„	„	
		29·2	ln	1·13	„	
* 28·017	28·02	28·2	2	„	„	24217·9
* 27·611	27·61	27·7	2	„	„	20·3
		26·7	ln	„	„	
		25·3	ln	„	„	
		24·2	1	„	„	
* 23·227	23·23	23·4	2	„	„	40·0
21·287		21·4	2	„	„	57·4
* 21·147	21·15		2	„	„	58·3
* 18·678			2	„	„	72·8
14·285		14·5	1	„	„	98·8
* 13·532	13·53	13·7	2	„	„	24303·2
* 12·910	12·90	12·95	4	„	„	06·9
09·796		10·0	0	„	„	25·3
* 08·218			2	„	„	34·6
* 08·003	08·00	08·2	4	„	„	35·9
06·065		06·3	0	„	„	47·4
* 02·438		02·6	2	„	„	68·9
01·906	01·91	02·1	4	„	„	72·1
* 00·533	00·53	00·6	2	„	„	80·2
*4097·965	4097·97	4098·00	4	„	6·9	95·6
* 97·185	97·97	97·5	2	„	„	24400·1
		95·3	ln	„	„	
* 91·218	91·22	91·5	1	1·12	„	35·7
		88·7	1	„	„	
* 85·567	85·57	85·62	5	„	„	69·5
		83·9	1	„	„	
82·947		83·2	2	„	„	85·2
* 80·777	80·78	80·76	7	„	„	98·3
79·440		79·6	1	„	„	24506·3
		78·2	1	„	„	
* 76·900	76·90	76·90	5	„	„	21·5
		74·4	1	„	„	
73·260		73·4	2	„	„	43·4
* 73·147	73·15		2	„	„	44·1
* 71·560		71·8	3	„	„	53·7
* 68·529	68·53	68·58	4	„	„	72·0
* 67·777	67·78	68·0	4	„	„	76·6
* 64·616	64·61	64·9	4	„	„	95·7
* 64·262	64·26	64·5	2	„	„	97·8
* 63·160	63·16	63·3	2	„	„	24604·5

\* Rowland and Tatnall: 4150·470, 4148·539, 4146·939, 4145·905, 4144·324, 4137·394, 4128·035, 4127·609, 4123·227, 4121·153, 4118·666, 4113·542, 4112·905, 4108·224, 4108·001, 4102·443, 4100·530, 4097·948, 4097·185, 4091·223, 4085·589, 4080·757, 4076·886, 4073·156, 4071·561, 4068·529, 4067·771, 4064·615, 4064·263, 4063·147.

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
*4063·021		4060·7	1 ln	1·12	6·9	24605·3
		58·2	ln	"	"	
* 54·216	4054·22	54·18	4	1·11	"	58·8
* 52·356	52·36	52·6	4	"	"	70·1
* 51·566	51·57	51·56	4	"	"	74·9
* 49·570	49·57	49·8	2	"	7·0	87·0
		47·4	ln	"	"	
*		46·2	2	"	"	
		43·5	2n	"	"	
42·123			2	"	"	24732·5
40·620		40·7	2	"	"	41·7
* 39·379	39·37	39·6	4	"	"	49·3
37·892		38·2	2	"	"	58·4
36·612		37·0	2	"	"	66·2
32·650		32·8	ln	"	"	90·5
* 32·363	32·36	32·6	4	"	"	92·3
* 31·147	31·15	31·4	3	"	"	99·8
		30·6	ln	"	"	
28·584		28·8	2	"	"	24815·8
26·650		27·0	1	"	"	27·5
* 24·848		25·1	2	"	"	38·3
24·449		24·7	2	"	"	41·1
* 24·001	24·00	24·00	4	"	"	43·9
22·837		23·1	2	"	"	51·1
* 22·327	22·33	22·30	5	"	"	54·2
21·146	21·15	21·4	3	"	"	61·0
19·699	19·70	19·9 Ir	2	"	"	70·5
18·891			1	"	"	75·5
		15·8	ln	1·10	"	
14·297	14·30	14·6	2	"	"	24904·0
13·871	13·87	14·1	2	"	"	06·6
* 13·655	13·66	13·8	4	"	"	07·9
11·882	09·91	11·6	2	"	"	19·0
		10·3	1	"	"	
* 08·422	08·42	08·6	2	"	"	41·5
* 07·680	07·68	07·8	3	"	"	45·1
* 06·749	06·75	07·0	4	"	"	50·9
* 05·789	05·79	06·0	4	"	"	56·9
		04·7	ln	"	"	
	03·15	03·3	ln	"	7·1	73·2
		01·8	1	"	"	
		3998·2	ln	"	"	
*3996·650	3996·65	96·6	2	"	"	25013·9
96·136	96·14	96·10	4	"	"	17·1
94·700			1	"	"	26·1
89·344			2	"	"	59·7
* 87·959	87·96	87·95	4	"	"	68·4
* 85·011	85·01	85·00	5	"	"	86·3
84·840			1	"	"	88·0
82·372	82·37	82·1	3	"	"	25103·5
* 79·591	79·59	79·58	2	"	"	21·1

\* Rowland and Tatnall: 4063·023, 4054·212, 4052·354, 4051·561, 4049·570, 4045·949, 4039·365, 4032·362, 4031·155, 4024·847, 4023·986, 4022·315, 4013·652, 4008·418, 4007·686, 4006·748, 4005·793, 3996·128, 3987·942, 3985·007, 3979·571.



## RUTHENIUM—continued.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda}$	
*3978·620	3978·62	3978·61	4	1·10	7·1	25127·3
* 74·646	74·65	74·7	5	1·09	"	52·3
72·568			4	"	"	65·5
		70·0	1	"	"	
69·936	69·94		0	"	"	85·8
	68·64 Ca	68·6 Ca	2	"	"	
* 65·057	65·06	65·05	2	"	"	25213·2
	61·84	62·3		"	"	33·7
* 57·596	57·60	57·7	4	"	"	60·8
57·376		57·5	2	"	"	62·2
* 52·850	52·85	52·9	0	"	"	91·1
52·436			1	"	7·2	93·6
* 51·351	51·35	51·4	4	"	"	25300·7
* 50·548		50·5	3	"	"	05·3
* 50·366	50·37	50·4	4	"	"	06·9
* 50·192		50·3	2	"	"	08·0
* 49·564	49·56	49·6	2	"	"	12·1
* 46·456		46·5	2	"	"	32·0
* 45·723	45·72	45·73	0	"	"	36·7
* 44·341	44·34	44·4	2	"	"	45·6
		43·2	ln	"	"	
* 42·209	42·21	42·3	4	"	"	59·3
* 41·811	41·81	42·0	3	"	"	61·8
39·268	39·27		0	"	"	78·2
* 38·045	38·05	38·2	3	"	"	86·1
34·352			1	"	"	25409·9
* 33·80 Ca	33·80 Ca	33·80 Ca	4	1·08	"	
33·06	33·06	33·1	1	"	"	18·3
32·444			0	"	"	22·2
* 31·936	31·94	31·93	4	"	"	27·6
26·581			0	"	"	60·2
* 26·071	26·07	26·05	6	"	"	63·5
* 24·776	24·78	24·9	2	"	"	72·0
* 23·636	23·64	23·62	6	"	"	79·4
22·476		22·5	1	"	"	86·9
21·061	21·06	21·1	4	"	"	97·1
* 19·711			0	"	"	25504·9
		16·7	ln	"	"	
* 15·000	15·00	15·1	4	"	"	35·6
		14·5		"	"	
* 12·248	12·25	12·3	3	"	"	53·5
11·279		11·4	3	"	"	59·9
* 09·229	09·23	09·22	5	"	"	73·3
* 08·907	08·91	09·0	3	"	7·3	75·3
		06·9	ln	"	"	
		06·7	ln	"	"	
06·141		06·3	1	"	"	93·4
		02·4	1	"	"	
* 01·393	01·39	01·5	ln	"	"	25624·6
		3898·9 Pt	4	"	"	

\* Rowland and Tatnall: 3978·600, 3974·650, 3965·055, 3957·600, 3952·844, 3951·360, 3950·556, 3950·371, 3950·183, 3949·560, 3946·468, 3945·730, 3944·339, 3942·215, 3941·819, 3938·060, 3933·700, 3931·920, 3926·062, 3924·774, 3923·615, 3920·060, 3914·990, 3912·252, 3909·222, 3908·906, 3901·391.



RUTHENIUM—*continued*.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
* 3898.500	3898.50	3898.6	ln	1.08	7.3	25643.5
* 97.390	97.39	97.5	3	"	"	50.9
		96.0	2	"	"	
		95.1	ln	1.07	"	
94.387	94.39	94.5	ln	"	"	70.6
* 92.916	92.92	93.0	2	"	"	80.4
* 92.366	92.37	92.35	2	"	"	83.9
* 91.567	91.57	91.6	4	"	"	89.3
* 90.350	90.35	90.4	2	"	"	97.3
		89.6	4	"	"	
* 87.962	87.96	88.0	1	"	"	25713.1
		87.6	2	"	"	
		86.5	1	"	"	
* 84.849	84.85	84.9	1	"	"	33.7
* 84.203	84.20	84.3	2	"	"	37.9
		82.3	2	"	"	
	80.95	81.0	1	"	"	59.6
		80.2	ln	"	"	
	79.15	79.2	2	"	"	71.1
	76.23	76.2	1	"	"	90.0
	73.65	73.6	1	"	"	25808.1
72.386			1	"	"	16.2
		71.4	1	"	"	
		71.0	1	"	"	
		70.8	1	"	"	
* 67.965	67.97	67.95	3	"	"	46.2
	65.55	65.6	2	"	"	62.2
		63.8	ln	"	"	
	62.82	62.80	6	"	"	80.5
		62.0	1	"	"	
		60.8	2	"	"	
		60.0 Fe	1	"	"	
		59.8	1	"	"	
		58.8	1	"	"	
* 57.689	57.69	57.65	5	"	"	25915.0
		57.2	1	"	"	
		56.6	2	1.06	"	
		54.9	1	"	"	
		53.4	ln	"	"	
* 52.26	52.26	52.3	2	"	"	51.4
		51.3	1	"	"	
	50.56	50.50	4	"	"	62.9
		49.6	1	"	"	
		49.1	1	"	"	
		48.2	1	"	"	
		46.7	2	"	"	
		43.2	1	"	"	
		42.8	1	"	"	
		42.6	1	"	"	
		41.1	2	"	"	
		40.9	2	"	"	
* 39.815	39.82	39.82	4	"	"	26035.6
		38.8	2	"	"	

\* Rowland and Tatnall: 3898.498, 3897.383, 3892.915, 3892.364, 3891.564, 3890.347, 3887.960, 3884.849, 3884.207, 3876.229, 3873.660, 3867.962, 3865.547, 3862.819, 3857.680, 3852.260, 3850.561, 3839.832.

## RUTHENIUM—continued.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
*3838·215	3838·22	3838·2	1	1·06	7·3	26046·5
		36·8	1	"	"	
		36·1	1	"	"	
* 35·19	35·19	35·2	2	"	"	67·0
		32·3 Pd	1	"	"	
* 31·946	31·95	31·82	4	"	"	89·1
		31·0	1	"	"	
		30·4	1	"	"	
		29·5	1	"	"	
* 28·859	28·86	28·8	2	"	"	26110·1
		28·0 Fe	1	"	"	
		27·5	1	"	"	
		26·3	1	"	"	
* 25·075	25·08	25·05	1	"	"	35·9
		24·5 Fe	1	"	"	
* 22·225	22·23	22·19	4	"	"	55·3
	20·50	20·5 Fe	1	"	"	
	20·00	19·8	1	"	"	70·7
* 19·184	19·18	19·2	2	"	"	76·3
		18·5 Rh	1	"	"	
		18·1	1	"	"	
* 17·439	17·44	17·43	3	"	"	87·9
		16·9	1	1·05	7·4	
	16·4	16·3	1	"	"	95·4
	15·90	16·0 Fe	1	"	"	98·7
* 15·0	15·0	15·0	2	"	"	26204·9
		14·1	1	"	"	
	13·20	13·2	1	"	"	17·3
* 12·874	12·87	12·83	3	"	"	27·3
		12·0	1	"	"	
		11·3	1	"	"	
* 08·82	08·82	08·7	2	"	"	47·4
		06·7	1	"	"	
* 05·57	05·57	05·5	2	"	"	69·9
	04·70			"	"	
	04·20			"	"	
* 03·40	03·40	03·4	2	"	"	85·3
		01·4	1	"	"	
* 00·39	00·39	00·38 Ir	4	"	"	
*3799·486	3799·49	3799·42	4r	"	"	26311·9
* 99·040	99·04	99·05	4	"	"	15·0
* 98·205	98·21	98·18	1	"	"	20·8
* 95·327	95·33	95·3	0	"	"	40·7
	95·00	95·0	2	"	"	43·1
		93·3 Rh	1	"	"	
* 90·649	90·65	90·62	5	"	"	73·3
		89·8	1	"	"	
		88·8	1	"	"	
		88·0 Fe	1	"	"	
* 86·193	86·19	86·27	5	"	"	26404·4
	84·30	84·4	1	"	"	17·3
		83·5	1	"	"	

\* Rowland and Tatnall: 3838·201, 3835·191, 3831·934, 3828·849, 3828·319, 3825·074, 3822·233, 3819·173, 3817·424, 3814·976, 3812·869, 3808·824, 3805·570, 3803·326, 3800·393, 3799·489, 3799·042, 3798·189, 3795·316, 3795·052, 3790·655, 3786·194.

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Hasehek		$\lambda +$	$\frac{1}{\lambda} -$	
3782.891	3782.89	3782.8	0	1.05	7.4	26434.3
81.313	81.31	81.25	3	"	"	38.4
	80.20	80.1	1	"	"	46.2
*	78.90	78.9	2	"	"	55.3
	78.00	78.0	2n	"	"	61.6
* 77.723	77.72	77.78	3	"	"	63.6
		74.6	1	1.04	"	
* 73.306	73.31	73.4	0	"	"	94.5
71.244		71.3	0	"	7.5	26509.0
		70.0	1n	"	"	
		69.3	1	"	"	
* 67.500	67.50	67.50	4	"	"	35.3
65.938		66.0	0	"	"	46.3
* 64.179	64.18	64.3	1	"	"	58.7
	64.00	64.0 Fe	1	"	"	
		62.7	1	"	"	
* 61.644	61.64	61.70	4	"	"	76.6
* 60.178	60.18	60.15	4	"	"	87.5
* 59.976	59.98	60.00	2	"	"	89.4
	58.50	58.5	1	"	"	98.9
	57.80	57.8	1	"	"	26603.8
	57.40	57.4	1n	"	"	06.6
* 56.083	56.08	56.07	4	"	"	16.0
* 55.865			2	"	"	18.6
* 55.241	55.24	55.2	3	"	"	21.9
* 53.695	53.70	53.70	4	"	"	32.9
	53.00	53.0	1	"	"	37.8
	52.70			"	"	
	52.00	52.0	1	"	"	45.0
	50.60	50.6	1	"	"	54.9
	49.60			"	"	
	48.40			"	"	
	48.15			"	"	
	47.15	47.1	1	"	"	79.4
46.372		46.4	2	"	"	85.0
	46.00			"	"	
	45.75	45.72	6	"	"	89.4
	44.55	44.55	2	"	"	97.9
* 44.367	44.37	44.35	2	"	"	99.2
	43.45	43.5	1	"	"	26703.8
* 42.938	42.94	42.95	4	"	"	09.5
* 42.435	42.44	42.45	5	"	"	13.0
		40.5	1	"	"	
* 39.622	39.62	39.60	4	"	"	33.2
* 39.058	39.06	39.1	2	"	"	37.2
* 38.774	38.77	38.8 Pd	2	"	"	39.2
* 37.904	37.90		2	1.03	"	51.6
* 37.548	37.55	37.5	3	"	"	48.0
	35.00 Fe	35.0	2	"	"	66.3
	34.70	34.6	2	"	"	68.4
	33.90	34.0	1n	"	"	74.1
* 33.187		33.3	2	"	"	79.2

\* Rowland and Tatnall: 3778.853, 3777.729, 3773.314, 3767.495, 3764.173, 3761.655, 3760.163, 3759.979, 3756.075, 3755.868, 3755.234, 3753.684, 3744.363, 3742.933, 3742.422, 3739.610, 3739.057, 3738.773, 3737.902, 3737.540, 3733.188.

## RUTHENIUM—continued.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
*3732.170	3732.17		2	1.03	7.5	26786.5
* 31.045		3731.0	2	"	"	94.6
* 30.745		30.65	3	"	"	26803.6
* 30.587	30.59		7	"	7.6	04.6
* 28.170	28.17	28.15	5	"	"	15.3
	27.33					
* 27.077	27.08	27.15	4	"	"	23.1
* 26.254	26.25	26.10	4	"	"	29.0
	25.59	25.6 Ir	1	"	"	
* 25.115	25.12	25.1	4	"	"	37.2
24.663			2	"	"	40.5
24.110	24.11	24.2	4	"	"	44.5
	22.80	22.9	1	"	"	53.9
		22.3	1	"	"	56.4
* 19.474	19.47	19.52	4	"	"	75.9
	18.60	18.5	1	"	"	84.2
* 17.823	17.82	17.8	2	"	"	89.9
* 17.152	17.15	17.13	4	"	"	94.6
16.583			1	"	"	26901.6
* 16.323	16.32	16.4	3	"	"	00.7
* 15.703	15.70	15.7	3	"	"	07.2
14.788		15.0	1	"	"	11.6
		13.6	1	"	"	
* 12.443	12.44	12.5	3	"	"	28.8
		11.2	1	"	"	
		10.5	1	"	"	
	09.35	09.4	1	"	"	51.2
	08.15	08.2	1	"	"	58.0
	07.05			"	"	
* 05.506	05.51	05.5	2	"	"	79.2
* 03.344	03.34	03.4	2	"	"	95.0
		03.1	1	"	"	
* 02.369	02.37	02.5	2	"	"	27002.1
		02.0	ln	"	"	
* 01.457		01.4	2	"	"	08.8
* 01.134	01.13	01.2	2	"	"	11.1
00.487		00.5	1	"	"	15.8
3698.016		3698.0	2	1.02	"	33.9
* 97.921	3697.92		3	"	"	34.6
* 96.738	96.74	96.7	4	"	"	43.3
		96.0	1	"	"	
	94.30	94.1	1	"	"	61.1
* 93.740	93.74	93.7	2	"	"	65.2
	92.90			"	"	
	92.60	92.5 Rh	1	"	"	
	91.10	91.1	1	"	"	84.5
90.179	90.18	90.19 Pd	1	"	"	91.3
		87.5	1	"	"	
* 86.742	86.74	86.6	1	"	"	27116.6
* 86.109	86.11	86.1	4	"	"	20.6
85.204	85.20		2	"	"	27.9

\* Rowland and Tathall: 3732.170, 3731.048, 3730.737, 3730.577, 3728.173, 3727.073, 3726.239, 3725.117, 3719.468, 3717.822, 3717.146, 3716.314, 3715.705, 3712.444, 3705.496, 3703.343, 3702.369, 3701.456, 3697.906, 3696.725, 3693.734, 3686.086.



RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
3683·730		3683·5	1	1·02	7·7	27138·7
		82·5	ln	"	"	
		81·8	ln	"	"	
* 78·465	3678·47	78·4	4	"	"	77·5
78·222	78·22	78·2	2	"	"	78·6
78·140			2	"	"	80·0
* 77·100	77·10	77·1	2	"	"	86·6
* 76·817	76·82	76·7	3	"	"	89·9
		76·4	1	"	"	
	75·60	75·7	1	"	"	98·7
* 75·408	75·41	75·4	3	"	"	27200·2
* 72·525		72·5	2	"	"	21·6
72·210		72·3	2	"	"	23·1
* 71·363		71·3	2	"	"	30·1
* 69·694	69·69	69·79	4	"	"	42·5
68·890		68·9	1	"	"	55·8
		67·1	1	"	"	
		65·4	ln	"	"	
		64·1	1	"	"	
* 63·526	63·53	63·53	5	"	"	88·4
* 61·727			2	"	"	27301·8
* 61·486	61·49	61·57	7	"	"	03·6
* 60·964	60·96	61·0	3	"	"	07·5
	60·25	60·2	2	"	"	12·8
	59·55			"	"	
		59·0	1	"	"	
57·716	57·72	57·82	1	1·01	"	32·9
57·315	57·32	57·4	2	"	"	34·8
	56·50	56·7	1	"	"	40·9
			2	"	"	43·8
* 54·559	54·56	54·55	4	"	"	55·6
53·857	53·86	53·9	2	"	"	60·6
	53·00	53·0	1	"	"	67·1
52·816			0	"	"	68·4
52·627			0	"	"	69·9
* 52·465	52·47	52·5	3	"	"	71·1
* 50·473	50·47	50·48	4	"	"	87·0
		50·0	1	"	"	
	49·75			"	"	
	48·85			"	"	
		48·0 Fe	1	"	"	
		47·5	1	"	"	
* 46·266	46·27	46·3	3	"	"	27417·6
45·827			1	"	"	20·9
		41·3	1	"	"	
* 40·791	40·79	40·7	4	"	"	51·3
* 38·163	38·16	38·2	2	"	7·8	78·6
* 37·614	37·61	37·62	4	"	"	82·7
		37·0	1	"	"	
* 35·661	35·66	35·6	4	"	"	97·5
* 35·093	35·09	35·10	7	"	"	27501·8
* 34·063	34·06	34·1	4	"	"	09·6

\* Rowland and Tatnall: 3678·456, 3677·098, 3676·808, 3675·400, 3672·521, 3671·355, 3669·688, 3663·520, 3661·721, 3661·525, 3660·961, 3654·549, 3652·460, 3650·465, 3646·262, 3640·786, 3638·161, 3637·612, 3635·658, 3635·084, 3634·064.

## RUTHENIUM—continued.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
3632.545	3632.55	3632.6	1	1.01	7.8	27521.1
* 31.860	31.86	31.9	3	"	"	26.3
	31.65 Fe	31.7 Fe		"	"	
29.352			1	"	"	44.8
		28.8 Ir		"	"	
	28.50			"	"	
		28.1		"	"	
* 27.425	27.43	27.5	2	"	"	60.0
* 26.897	26.90	26.88	5	"	"	71.0
* 25.345	25.35	25.30	5	"	"	75.8
23.995			0	"	"	86.1
23.804	23.80	23.8	4	"	"	87.5
* 20.426	20.43	20.4	4	"	"	27613.2
* 19.334	19.33	19.4	4	"	"	21.6
	18.90 Fe	18.8 Fe		"	"	
* 17.090	17.09	17.2	4	1.00	"	38.7
		15.4		"	"	
	15.05			"	"	
14.486		14.5	1	"	"	58.6
		13.3		"	"	
		12.6		"	"	
	12.30			"	"	
		11.6		"	"	
		10.8	1	"	"	
		09.6 Pd	1	"	"	
* 3609.241			2	"	"	98.8
* 08.862	08.86	08.9	2	"	"	27701.8
		06.6	1	"	"	
06.297		06.3	1	"	"	21.4
* 05.792	05.79	05.8 Ir	3	"	"	25.4
		03.3	1	"	"	
		02.6	1	"	"	
* 01.627	01.63	01.7	2	"	"	57.4
		00.8	1	"	"	
* 3599.913	3599.91	3599.95	4	"	"	70.7
99.548			0	"	"	73.4
		99.0	1	"	"	
		97.5	1	"	"	
* 96.315	96.32	96.28	5r	"	"	98.4
		95.8	1	"	"	
* 93.177	93.18	93.17	4r	"	7.9	27822.6
	91.58	91.7	1	"	"	35.0
91.044	91.04	91.0	1	"	"	39.1
		90.7	1	"	"	
* 89.370	89.37	89.37	4	"	"	52.1
87.344	87.34	87.34	2	"	"	67.9
		85.5	1	"	"	
		85.3	1	"	"	
	85.17	85.0	1	"	"	84.8
*	84.21	84.3	2	"	"	92.3
	81.31 Fe	81.4 Fe	1	"	"	

\* Rowland and Tatnall: 3631.859, 3627.433, 3626.886, 3625.339, 3620.434, 3619.348, 3617.100, 3609.247, 3608.878, 3605.785, 3601.630, 3599.914, 3596.342, 3593.178, 3589.360, 3584.349.

RUTHENIUM—*continued*.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
*3579·923	3579·92	3579·8	0	1·00	7·9	27925·7
	78·90	78·7	1		"	33·7
	77·55	77·6	1	0·99	"	44·2
	77·10	77·1	2	"	"	47·7
	76·17			"	"	
* 74·744		75·1	1	"	"	
	74·74	74·7	3	"	"	66·1
	74·00			"	"	
		73·8 Ir	1	"	"	
		73·3	1	"	"	
	72·13	72·1	1	"	"	86·6
* 70·743		71·9	1	"	"	
	70·74	70·74	1	"	"	97·6
* 67·308		68·6	1	"	"	
	67·31	67·3	2	"	"	28024·4
	66·59	66·6	2	"	"	30·0
		65·5 Fe	1	"	"	
* 64·945	64·95	65·0	0	"	"	43·0
* 64·714	64·71	64·7	1	"	"	44·8
* 64·517	64·52	64·6	0	"	"	46·4
* 62·035		63·7	1	"	"	
		63·3	1	"	"	
	62·75	62·7	1	"	"	60·3
	62·04	62·1	0	"	"	65·9
	61·83	61·7	1	"	"	67·6
		61·2	1	"	"	
	60·85	60·8 Os	2	"	"	75·4
	60·00	60·0	1	"	"	82·0
		59·8	1	"	"	
	57·20	57·2	0	"	"	28104·1
* 57·203		57·0	1	"	"	
				"	"	
* 56·779	56·78	56·8	0	"	"	07·4
* 54·002	54·00	53·9	1	"	"	29·4
	50·73	50·7	1	"	8·0	55·2
* 50·420	50·42	50·4	2	"	"	58·4
	49·90	49·8	1	"	"	61·8
	48·70	48·6	1	"	"	71·3
* 47·136	47·14	47·1	1	"	"	83·7
		46·9	2b	"	"	
		42·7	1	"	"	
* 41·788	41·79	41·7	3	"	"	28226·3
		41·1	1	"	"	
		40·9	1	"	"	
		40·3	1	"	"	
			2	"	"	
* 39·518			2	"	"	44·8
* 39·418	39·42	39·40	2	"	"	45·2
* 38·100	38·10	38·03	3	"	"	55·8
	36·78	36·7	2	0·98	"	66·3
* 35·985	35·99	36·0	2	"	"	72·7
* 35·529	35·53	35·5	2	"	"	76·3
* 32·965	32·97	32·95	2	"	"	96·8
* 31·545	31·55	31·5	3	"	"	28308·2
	29·26	29·4	2	"	"	26·5

\* Rowland and Tatnall: 3579·924, 3574·748, 3571·913, 3570·748, 3567·309, 3564·949, 3564·719, 3564·509, 3562·043, 3557·207, 3556·773, 3553·998, 3550·419, 3547·131, 3541·777, 3539·521, 3539·415, 3538·100, 3535·988, 3535·537, 3532·962, 3531·543.

## RUTHENIUM—continued.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
*3528.841	3528.84	3528.7	2	0.98	8.0	28328.9
	28.05			"	"	
	27.39	27.3	1	"	"	41.6
		26.6	1	"	"	
		26.4	1	"	"	
		25.7	ln	"	"	
	24.62	24.6	2	"	"	63.8
	24.16	24.0	2	"	"	67.5
		22.4	1	"	"	
		22.2	1	"	"	
* 20.285	20.29	20.22	4	"	"	98.9
* 19.795	19.80	19.80	3	"	"	28402.7
	19.10	19.1	1	"	"	08.4
	18.00			"	"	
16.046	16.05	16.0	0	"	"	33.0
		15.2	ln	"	"	
14.911			1	"	"	42.2
* 14.649	14.65	14.60	4	"	"	44.3
* 13.807	13.81		2	"	"	51.2
		13.0	1	"	"	
		11.5	1	"	"	
		10.5	ln	"	"	
09.870			2	"	8.1	83.0
	09.35	09.30	4	"	"	87.2
		07.3	ln	"	"	
		06.9	ln	"	"	
		05.9	ln	"	"	
	04.65			"	"	
	03.60			"	"	
02.578	02.58	02.5	2	"	"	28542.3
01.510			1	"	"	53.1
*3499.098	3499.10	3499.05	10r	"	"	70.7
* 98.103	98.10	98.0	1	0.97	"	79.6
* 96.293			2	"	"	93.6
* 96.145	96.15	96.1	2	"	"	94.8
* 94.410		94.2	3	"	"	28609.0
93.377	93.38	93.2	2	"	"	17.5
92.256	92.26	92.0	1	"	"	26.7
90.879	90.88	90.8	1	"	"	46.8
	90.30	90.3	1	"	"	42.7
89.895			1	"	"	53.7
		88.2	ln	"	"	
	87.87	87.7	1	"	"	62.7
86.948			2	"	"	70.3
86.360			2	"	"	74.0
		85.6	ln	"	"	
	83.65	83.7	1	"	"	97.4
* 83.463	83.46		2	"	"	98.9
* 83.317	83.32	83.3	2	"	"	28700.1
82.499		82.5	2	"	"	06.8
		82.0	1	"	"	
	81.66			"	"	
* 81.465	81.47	81.42	4	"	"	15.4

\* Rowland and Tatnall: 3528.832, 3520.286, 3519.785, 3514.631, 3513.799, 3499.095, 3498.086, 3496.272, 3496.131, 3494.404, 3483.438, 3483.317, 3481.449.



RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
3481·044			0	0·97	8·1	28718·8
80·295	3480·30	3480·2	2	"	"	25·0
	79·45	79·5	2	"	"	32·0
		77·6	ln	"	"	
77·350		77·2	0	"	"	55·0
	75·00	75·0	1	"	"	68·9
* 73·900	73·90	73·90	5	"	"	78·0
	73·45	73·4	1	"	"	81·7
72·843	72·84	72·7	2	"	"	86·8
	72·39	72·4	2	"	"	90·5
	70·20 }		1	"	"	
	69·80 }	70·0	1	"	"	
		69·5	1	"	"	
		68·1	ln	"	"	
* 67·190	67·19	67·3	2	"	8·2	28833·6
65·437	65·44	65·5	1	"	"	48·1
63·751			0	"	"	62·2
* 63·289	63·29	63·2	4	"	"	64·0
* 62·208	62·21	62·1	2	"	"	66·1
	61·55			"	"	
59·736		59·6	2	"	"	95·7
		58·3	1b	0·96	"	
57·849			0	"	"	28911·5
		57·3	1	"	"	
	57·05			"	"	
* 56·769	56·77	56·7	4	"	"	20·5
55·888			2	"	"	27·9
55·548		55·6	2	"	"	30·8
53·373			0	"	"	49·0
53·056	53·06	53·0	4	"	"	51·7
		52·1	1	"	"	
51·014			0	"	"	68·8
49·608			0	"	"	80·6
* 49·105	49·11	49·1	4	"	"	84·9
	46·96	46·8	ln	"	"	
46·630			2	"	"	29005·6
46·227		46·3	2	"	"	09·0
46·095	46 10		0	"	"	10·1
45·675			0	"	"	13·7
45·453			1	"	"	16·4
		45·3	1	"	"	
44·574			1	"	"	23·0
43·818			0	"	"	29·3
43·309			0	"	"	33·6
41·942			0	"	"	45·3
* 40·361	40·36	40·4	4	"	"	58·5
39·835			2	"	"	63·0
38·819			0	"	"	71·5
* 38·522	38·52	38·5	4	"	"	74·1
* 36·886	36·89		5r	"	"	87·9
* 36·481			2	"	"	91·3
36·237			0	"	"	93·4
* 35·340	35·34	35·3	4	"	"	29101·0
	34·93			"	"	

\* Rowland and Tatnall: 3473·892, 3467·192, 3463·286, 3462·186, 3456·763, 3449·107, 3440·351, 3438·510, 3436·883, 3436·475, 3435·327.

## RUTHENIUM—continued.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Hasehek		$\lambda +$	$\frac{1}{\lambda} -$	
3434·325	3434·33		0	0·96	8·2	29109·6
* 33·406	33·41	3433·45	4	"	"	17·4
* 32·909	32·91	32·9	4	"	"	21·5
32·560		32·5	0	"	"	24·6
* 32·354	32·35		3	"	"	26·2
31·905			0	"	"	37·3
* 30·910	30·91	31·05	4	"	"	38·5
30·568		30·6	0	"	"	41·4
* 29·702	29·70	29·6	4	"	"	48·8
* 28·790	28·79	28·60	2	"	"	56·5
* 28·476			4r	"	"	59·2
27·717	27·72		0	"	"	65·6
* 26·120	26·09	26·2	2	"	"	79·2
	24·39	{ 24·5	1	"	"	
		{ 24·3	1	"	"	94·1
22·578			2	"	"	29209·4
20·881			0	"	"	23·9
* 20·243	20·24	20·2	4	"	"	29·3
		20·0	ln	"	"	
* 19·394	19·39		2	"	"	36·6
* 18·125	18·13	18·1	2	"	"	47·5
17·790			1	0·95	"	50·4
* 17·493	17·49	17·45	7	"	"	52·9
	16·90	16·7	1	"	"	58·0
* 16·329	16·33	16·4	1	"	"	62·9
		15·6	1	"	"	
* 14·787	14·79	14·7	3	"	"	76·1
		14·5	1	"	"	
14·422			2	"	8·3	79·2
14·130			0	"	"	80·7
13·870			0	"	"	75·4
* 12·947	12·95	12·8	3	"	"	91·9
12·221			2	"	"	98·1
* 11·768	11·77	11·6	4	"	"	29302·0
	10·84	10·7	2	"	"	10·0
	10·10			"	"	
09·707			2	"	"	19·7
* 09·420	09·42	09·42	5	"	"	22·2
		09·2	2	"	"	
07·042			0	"	"	42·7
* 06·736			2	"	"	45·3
* 06·017			2	"	"	51·5
05·426			0	"	"	56·6
03·924		03·7	1	"	"	75·4
		02·7	1	"	"	
		02·00	4	"	"	
* 01·878	01·88		3	"	"	87·2
* 01·637	01·64		2	"	"	89·3
01·304		01·4	0	"	"	92·1
00·890			2	"	"	95·8
00·738			1	"	"	97·1

\* Rowland and Tatnall: 3433·397, 3432·896, 3432·348, 3430·908, 3429·689, 3428·769, 3428·460, 3426·089, 3420·236, 3419·389, 3418·117, 3417·466, 3416·320, 3414·782, 3412·939, 3411·780, 3409·424, 3406·731, 3406·025, 3401·876, 3401·646.

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
3400·116			0	0·95	8·3	29402·5
		3399·4	1	"	"	
3399·040	3399·15 99·04		0	"	"	11·8
		98·9	2	"	"	
98·470			0	"	"	16·7
96·967			4	"	8·4	32·2
96·060			0	"	"	37·5
95·465		95·3	0	"	"	42·6
		94·0	ln	"	"	
* 92·654	92·65	92·68	4	"	"	67·0
* 92·032	92·03	92·0	2	"	"	72·4
91·042			2	"	"	81·0
* 89·639	89·64	89·6	4	"	"	93·3
89·250	89·25	89·3	0	"	"	96·6
* 88·849	88·85	88·8	4	"	"	29500·1
87·967	87·97	88·0	0	"	"	07·8
* 87·368		87·3	2	"	"	13·0
86·390		86·3	2	"	"	21·5
* 85·838			2	"	"	26·4
* 85·609	85·61	85·7	2	"	"	28·4
* 85·303	85·30	85·2	4	"	"	31·0
83·053			0	"	"	40·6
		82·3	1	"	"	
		81·6	1	"	"	
81·040		81·0	2	"	"	68·3
* 80·301	80·30	80·3	4	"	"	74·7
* 79·747	79·75	79·6	4	"	"	79·6
79·402		79·4	2	"	"	82·6
* 78·165	78·17	78·2	4	"	"	93·4
76·186			1	0·94	"	29610·8
75·377			2	"	"	17·9
75·036			2	"	"	20·9
* 74·790	74·79	74·7	4	"	"	23·1
74·115	74·12		2	"	"	29·0
	73·45	73·5	1	"	"	34·8
		73·3 Pd	1	"	"	
72·922	72·92		0	"	"	39·5
* 71·990	71·99		4	"	"	47·7
71·793		71·8	0	"	"	49·4
70·720	70·72		2	"	"	58·9
	70·19	70·10	4	"	"	63·5
69·813		69·7	2	"	"	66·4
69·433	69·43	69·40	2	"	"	70·2
* 68·588	68·59	68·58	6	"	"	77·6
68·053			0	"	"	82·3
67·868			0	"	"	84·0
65·470			0	"	"	29705·1
65·163			0	"	"	07·8
64·933		64·8	1	"	"	09·9
* 64·230	64·23	64·1	4	"	"	
* 62·457	62·46	62·3	2	"	"	16·0

\* Rowland and Tatnall: 3392·672, 3392·032, 3389·644, 3388·846, 3387·369, 3385·836, 3385·608, 3385·207, 3380·308, 3379·744, 3378·170, 3374·790, 3371·992, 3368·604, 3368·524, 3364·243, 3362·473.

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
*3362·142		3362·1	4	0·94	8·4	29731·7
61·295	3361·30	61·2	2	"	"	34·5
	60·20	60·0	1	"	"	42·0
* 59·230	59·23	59·30	6	"	8·5	59·2
58·110			0	"	"	70·2
56·598			2	"	"	83·8
56·327		56·3	2	"	"	86·1
55·803		55·7	2	"	"	90·7
54·001			2	"	"	29806·6
* 53·776		53·6	4	"	"	08·3
53·444	53·44	53·3	2	"	"	11·6
53·122			1	"	"	14·5
* 52·060		52·0	4	"	"	23·9
50·681			2	"	"	36·3
50·363	50·36	50·30	0	"	"	39·1
50·236			2	"	"	40·2
49·822	49·82		0	"	"	43·8
48·833			2	"	"	52·6
* 48·145	48·15	48·0	2	"	"	58·8
* 47·748	47·75	47·6	4	"	"	62·4
46·360			0	"	"	73·9
* 45·450	45·45	45·3	4	"	"	83·7
44·934			2	"	"	87·5
* 44·666	44·67		4	"	"	89·8
	43·32	43·2	2	"	"	92·9
42·999			0	"	"	29904·8
42·854	42·85	42·7	0	"	"	06·4
* 41·809	41·81	41·7	4	"	"	15·4
* 41·361		41·3	1	"	"	19·3
* 41·230			2	"	"	20·4
39·932	39·93	39·8	2	"	"	37·6
* 39·691	39·69	39·72	6	"	"	34·4
39·092			0	"	"	39·7
38·849			2	0·93	"	41·9
		38·3	ln	"	"	
37·963	37·96	37·8	4	"	"	49·9
36·774		36·6	3	"	"	60·6
36·296			2	"	"	64·8
* 35·822	35·82	35·7	4	"	"	69·1
34·764			0	"	"	78·6
* 32·768		32·7	2	"	"	96·6
32·483			0	"	"	99·2
* 32·186		32·1	4	"	"	30001·8
		31·2	1	"	"	
28·583			2	"	"	34·3
* 27·831		27·6	4	"	"	41·1
25·373	25·37	25·4	2	"	"	53·3
* 25·136	25·14	25·0	4	"	8·6	65·3
24·509	24·51	24·6	0	"	"	71·3
24·077			2	"	"	74·9
23·226			4	"	"	82·6
22·368		22·2	4	"	"	90·4

\* Rowland and Tatnall: 3362·151, 3359·239, 3353·790, 3352·075, 3348·847, 3348·153, 3347·757, 3345·457, 3344·679, 3341·811, 3341·365, 3341·230, 3339·690, 3335·836, 3332·781, 3332·190, 3327·843, 3325·136.



RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
3321·634			0	0·93	8·6	30097·1
21·385		3321·2	2	"	"	99·3
19·944			1	"	"	30112·4
19·655			1	"	"	15·0
* 18·992	3318·99	18·8	6	"	"	21·0
* 18·012	18·01	17·9	4	"	"	29·9
	17·66	17·5d	2	"	"	33·1
	17·05	17·0	1	"	"	38·7
* 16·523	16·52	16·55	6	"	"	43·4
* 15·590			2	"	"	51·9
* 15·365	15·37	15·30	3	"	"	54·0
15·181			2	"	"	55·6
14·203			2	"	"	64·5
	12·99	12·7	1	"	"	75·6
12·348			1	"	"	81·4
12·068			0	"	"	84·0
11·388			0	"	"	90·2
* 11·090	11·09	11·0	4	"	"	92·9
10·220		10·2	0	"	"	30200·9
09·965	09·97		0	"	"	06·1
	09·38	09·2	1	"	"	08·5
	09·00			"	"	
08·751		08·8	0	"	"	14·3
08·122	08·12	08·1	4	"	"	20·0
07·679		07·7	2	"	"	24·1
	06·81	06·6	1	"	"	32·1
* 06·305	06·31	06·2	4	"	"	36·5
05·804			0	"	"	41·1
	05·15	05·1	2	"	"	47·2
* 04·948		04·9	2	"	"	49·1
04·772			0	"	"	50·7
04·634			2	"	"	51·9
04·418			0	"	"	53·9
* 04·141	04·14	04·0	4	"	"	56·5
02·312			1	"	"	73·2
	01·94	01·9 Pt	1	"	"	76·6
01·726	01·73	01·6	5	"	"	78·6
	01·35	01·1	2	"	"	81·9
3299·926		00·0	0	"	"	95·1
* 99·479	3299·48	3299·3	2	0·92	"	99·2
* 98·559	98·56	98·4	4	"	"	30307·7
* 98·096	98·10	98·0	3	"	"	11·9
* 97·393	97·39	97·2	3	"	"	19·4
* 96·786	96·79	96·6	2	"	"	24·0
* 96·252	96·25	96·1	4	"	"	28·9
94·926			0	"	"	41·1
* 94·269	94·27	94·38	6	"	"	47·1
92·390		92·1	2	"	"	64·4
91·789		91·8	2	"	"	70·2
		91·5	ln	"	"	
91·250			2	"	"	75·0
		91·0	1	"	"	

\* Rowland and Tatnall: 3318·965, 3318·025, 3316·524, 3315·579, 3315·363, 3311·096, 3306·310, 3304·951, 3304·126, 3299·466, 3298·549, 3298·089, 3297·389, 3296·780, 3296·248, 3294·233.

## RUTHENIUM—continued.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
3289.389		3289.3	2n	0.92	8.6	30392.2
	3286.55	86.8	1	"	8.7	30418.3
86.040			1	"	"	23.0
85.505		85.7	2	"	"	28.0
* 85.067			4	"	"	32.1
	84.46	84.5	1	"	"	37.7
		84.3	2	"	"	
82.744		82.5	0	"	"	53.6
81.995			2	"	"	60.6
81.735	81.74	81.5	0	"	"	63.0
	81.26	81.2	1	"	"	67.3
80.678			1	"	"	72.9
80.599		80.5	2	"	"	73.5
79.521			2	"	"	83.5
* 77.699	77.70	77.6	4	"	"	30500.5
76.820		76.6	0	"	"	08.7
	75.87	75.7	1	"	"	17.5
* 74.831	74.83	74.7	5	"	"	27.2
73.765	73.77	73.6	0	"	"	37.1
* 73.217	73.22	73.1	5	"	"	42.3
72.366			0	"	"	50.2
		72.0	ln	"	"	
71.746			0	"	"	56.0
		71.2	ln	"	"	
70.388		70.2	2	"	"	68.7
	69.80			"	"	
69.336			2	"	"	78.5
69.087	69.05	68.93	2	"	"	80.9
* 68.345	68.35	68.3	5	"	"	87.8
67.269		67.2 Os	0	"	"	97.9
	67.07			"	"	
66.588	66.59	66.4	4	"	"	30604.3
		66.1	1	"	"	
* 64.808	64.81	64.90	2	"	"	31.0
* 64.692				"	"	32.1
* 63.988		63.9	3	"	"	39.7
63.740		63.7	3	"	"	41.0
		62.5 Os	0	"	"	
		61.7	ln	"	"	
* 61.257		61.1	1	"	"	54.3
* 60.494	60.49	60.45	3	"	"	61.5
* 60.304	60.30	60.1	5	"	"	63.3
* 59.811	59.81	59.6	2	"	"	67.9
59.111	59.11	59.0	4	0.91	"	74.5
* 58.176	58.18	58.0	0	"	"	83.3
	57.94	57.7	3	"	"	90.6
		57.2	1	"	"	
56.746			0	"	"	96.8
* 56.477	56.48	56.3	4	"	"	99.3
55.356		55.2	1	"	"	30709.9
55.173			0	"	"	11.6
* 54.856	54.86	54.6	4	"	"	14.6

\* Rowland and Tatnall: 3285.066, 3277.697, 3274.834, 3273.208, 3268.346, 3264.790, 3264.688, 3263.984, 3261.256, 3260.477, 3260.301, 3259.805, 3258.173, 3256.460, 3254.834.

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
*3254·674	3254·67	3254·5	4	0·91	8·7	30715·4
	53·36	53·2	2	"	"	28·8
53·136			2	"	"	30·9
* 53·038			1	"	"	31·8
52·683		52·8	2	"	8·8	35·1
52·400			0	"	"	37·7
* 52·031	52·03		3	"	"	41·1
		50·7 Pd		"	"	
* 51·464		51·4	3	"	"	46·6
	51·10			"	"	
50·605			1	"	"	59·0
50·065	50·07	49·9	2	"	"	59·8
48·977			2	"	"	70·1
	48·04	48·0	1	"	"	79·0
47·501	47·50	47·4	0	"	"	84·1
46·380	46·38	46·2	0	"	"	94·7
45·746	45·75	45·6	0	"	"	30800·8
44·719			0	"	"	10·3
44·585			1	"	"	11·6
44·475		44·4	0	"	"	12·6
* 43·638	43·64	43·4	2	"	"	20·8
42·978		42·8 Pd	2	"	"	28·9
42·283	42·28	42·1	2	"	"	33·6
41·884		41·6 Ir	0	"	"	37·5
41·643	41·64		0	"	"	39·7
* 41·362	41·36	41·2	4	"	"	42·4
* 39·745	39·75	39·5	3	"	"	57·8
38·904			2	"	"	65·8
* 38·667	38·67	38·4	5	"	"	68·1
38·132			0	"	"	73·2
36·101	36·10		2	"	"	92·6
	35·85	35·7	2	"	"	95·0
35·431			0	"	"	99·0
35·230		35·0	2	"	"	30900·9
34·920		34·7	2	"	"	03·9
	34·39	34·3	2	"	"	09·0
33·650			0	"	"	16·0
* 32·881	32·89	32·7	4	"	"	23·4
32·180			1	"	"	30·1
31·869	31·87	31·5	0	"	"	33·0
30·738			2	"	"	43·9
29·881		28·7	2	"	"	52·1
28·850			0	"	"	62·0
* 28·651	28·65	28·63	4	"	"	63·9
* 28·276		28·1	2	"	"	67·5
* 28·021		27·8	3	"	"	69·9
* 27·016	27·02	26·8	2	"	"	79·5
* 26·497	26·50	26·4	5	"	"	85·6
25·418			0	"	"	94·9
	25·03	24·9	1	"	"	98·6
24·772		24·7	2	"	8·9	31001·0
	24·18	24·0	1	"	"	07·7

\* Rowland and Tatnall: 3254·670, 3253·041, 3252·029, 3251·459, 3243·632, 3241·360, 3239·727, 3238·660, 3232·872, 3228·651, 3228·280, 3228·007, 3227·027, 3226 502.

RUTHENIUM—*continued*.

Wave-length (Kaysers) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
3223·723			0	0·91	8·9	31011·1
* 23·393	3223·39	3223·2	4	"	"	14·3
	22·07	21·9	2	"	"	27·1
21·493	21·49	21·3d	1	"	"	32·6
* 21·303			2	"	"	34·4
20·899	20·90		2	0·90	"	47·1
* 20·195	20·20	20·1	2	"	"	45·1
	19·49	19·4	2	"	"	51·9
19·274			1	"	"	54·0
		18·9	1	"	"	
	17·96	17·7	2	"	"	66·7
* 16·641	16·64	16·5	4	"	"	79·4
		16·0	1	"	"	
15·613			0	"	"	89·4
14·475		14·3	2	"	"	31100·4
	13·33	13·3	1	"	"	11·4
* 13·098	13·10	13·0	3	"	"	13·7
	12·30			"	"	
		12·0 Ir	ln	"	"	
	11·38	11·3	1	"	"	30·4
	10·95			"	"	
		10·6 Pd	1	"	"	
10·287	10·29	10·1	2	"	"	41·0
09·758		09·6	1	"	"	46·1
	09·43			"	"	
08·865			1	"	"	54·8
08·542			3	"	"	57·9
08·405			0	"	"	59·2
07·751	07·75	07·7	0	"	"	65·6
	07·43	07·3	2	"	"	68·9
	06·82	06·7	2	"	"	74·6
05·428	05·43	05·3	2	"	"	88·2
	05·08	05·0		"	"	91·5
	04·36	04·2	2	"	"	98·6
	03·62	03·6	2	"	"	31205·8
		03·0	1	"	"	
02·705		02·5	2	"	"	14·7
* 01·604			3	"	"	25·4
01·372	01·37	01·38	2	"	"	27·7
3199·238		3199·0 Ir	0	"	"	48·5
	3198·74	98·6	2	"	"	53·4
98·437		98·5	2	"	"	56·4
97·603		97·7	0	"	"	64·5
* 96·718	96·72	96·5	4	"	"	73·2
	95·85	95·6	1	"	"	81·7
95·438			1	"	"	85·7
95·137	95·14	95·1	0	"	"	88·6
93·617		93·5	2	"	"	31303·5
	92·52	92·5d	1	"	"	04·5
* 92·171	92·17	92·1	2	"	"	07·9
91·900		91·7	2	"	"	20·4
91·303			1	"	"	26·2
* 90·088	90·09	89·9	4	"	"	38·2

<sup>A</sup> Rowland and Tatnall: 3223·394, 3221·311, 3220·199, 3216·646, 3213·105, 3201·631, 3196·725, 3192·191, 3190·096.



RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
*3189·835		3189·7	3	0·90	8·9	31340·7
89·418		89·2	2	"	"	44·7
		88·8	1	"	"	
88·713		88·5	2	"	"	51·7
* 88·463	3188·46	88·45	5	"	"	54·1
88·057			2	"	"	58·2
86·867			1	"	"	69·9
* 86·171	86·16	86·0	4	"	"	76·7
85·553			2	"	"	82·8
85·276	85·28	85·3	0	"	"	85·5
		84·9	1	"	"	
		84·1	1	"	"	
		83·9	1	"	"	
	83·54	83·4	2	"	"	31402·7
		82·0	1	"	"	
81·312		81·4	0	0·89	"	24·7
81·126			0	"	"	26·5
80·569			0	"	9·0	31·9
79·380	79·38	79·2	2	"	"	43·6
78·843			1	"	"	49·0
* 77·159	77·16	77·18	4	"	"	65·6
76·401		76·2	3	"	"	73·2
	75·32	75·30	4	"	"	84·0
		75·10	4	"	"	
* 74·243	74·24	74·1 Os ?	4	"	"	94·5
73·500			2	"	"	31501·9
73·221			2	"	"	04·7
72·778	72·78	72·6	0	"	"	09·1
71·352			2	"	"	23·3
70·196		70·0	2	"	"	34·8
* 68·648	68·65	68·5	5	"	"	50·2
68·355			1	"	"	53·1
67·514	67·51	67·58	0	"	"	61·5
	66·68	66·4	2	"	"	69·8
	66·24	66·0	2	"	"	74·1
65·507			0	"	"	81·5
65·307	65·31		1	"	"	83·5
65·086		65·0	0	"	"	85·7
64·939	64·94	65·0	0	"	"	87·2
		64·7	1	"	"	
		64·1	1	"	"	
		64·0	1	"	"	
63·186	63·30	63·25	0	"	"	31604·7
	60·80	60·78	4	"	"	28·6
* 60·036	60·04	60·05	4	"	"	36·2
59·003 Ca ?	59·00	58·7	4	"	"	46·5
57·739		57·5	2	"	"	59·2
		57·3	1	"	"	
		57·1	1	"	"	
56·917			2	"	"	67·5
56·733			0	"	"	69·3
	55·90			"	"	
		55·4	1	"	"	

\* Rowland and Tatnall: 3189·843, 3188·468, 3186·162, 3177·170, 3174·254, 3168·678, 3160·042.

RUTHENIUM—*continued*.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
3154.543			2	0.89	9.0	31691.3
* 53.927	3153.93	3153.7	4	"	"	97.5
	52.35	52.2	1	"	"	31713.3
51.780			1	"	"	19.1
	51.25	51.3	1	"	"	24.4
* 50.803	50.80	50.5	4	"	"	28.9
50.283			1	"	"	34.2
		49.7	1	"	"	
		49.3	1	"	"	
48.593	48.59	48.7	2	"	"	51.2
48.138			0	"	"	55.8
47.547	47.55	47.62	0	"	"	61.8
* 47.323			2	"	"	64.0
46.183	46.18	46.0	2	"	9.1	75.5
44.820			2	"	"	89.0
* 44.369	44.37	44.2	4	"	"	93.8
43.764	43.76	43.80	0	"	"	31800.0
	43.46	43.40	4	"	"	03.0
	41.66	41.5	2	0.88	"	21.2
* 41.081	41.08	40.9	4	"	"	27.1
* 40.596		40.4	3	"	"	29.0
40.201			1	"	"	36.0
39.379	39.65	39.5 Pt ?	2	"	"	41.6
38.884			2	"	"	49.4
		38.0	1	"	"	
37.036			0	"	"	68.2
* 36.663	36.66		3	"	"	71.9
36.451		36.5	1	"	"	74.1
36.044	36.04	35.98	2	"	"	78.3
	35.48			"	"	
35.170		35.1	0	"	"	87.2
34.895	34.90	34.98	1	"	"	89.1
33.800			2	"	"	31901.0
		33.5 Ir	1	"	"	
* 32.988		32.99	4	"	"	09.3
		32.6	2	"	"	
		32.5	2	"	"	
32.122			1	"	"	18.2
30.709			0	"	"	32.5
* 29.935			3	"	"	40.4
29.717		29.7	2	"	"	42.7
29.574		29.5	0	"	"	44.1
		28.8	1n	"	"	
28.539			2	"	"	54.7
	28.07	28.05	4	"	"	59.5
27.643			0	"	"	63.9
27.387			1	"	"	66.5
26.730	26.73	26.75	2	"	"	73.2
* 26.068			4	"	"	80.0
		25.7	1	"	"	
	24.98			"	"	
* 24.709		24.6	2	"	"	93.9

\* Rowland and Tatnall: 3153.941, 3150.816, 3147.326, 3144.383, 3141.094, 3140.604, 3136.671, 3132.995, 3129.951, 3126.075, 3124.720.

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
*3124·481	3124·48		2	0·88	9·1	31996·2
* 24·277	24·28	3124·1	4	"	"	98·3
		23·8	2	"	"	
23·610			0	"	"	32005·1
22·970			0	"	"	11·7
22·108			1	"	"	20·5
	20·90			"	"	
20·650		20·7	1	"	"	35·5
* 18·792		18·6	4	"	"	54·6
* 18·170		18·0	4	"	"	61·0
17·563			0	"	"	67·2
17·181			0	"	"	71·1
16·945			1	"	"	83·6
		16·5	1n	"	"	
15·536		15·5	0	"	"	88·1
	14·53	14·4	1n	"	9·2	98·5
13·756	13·76	13·8 Pd	0	"	"	32106·4
13·502		13·3	2	"	"	09·0
* 12·782	12·78	12·5	2	"	"	16·4
12·408		12·3	2	"	"	20·3
* 12·012	12·01		3	"	"	24·3
		11·8	1	"	"	
	11·24	11·1	1	"	"	32·3
* 10·641	10·64	10·5	4	"	"	38·8
10·147			0	"	"	43·6
		09·5	1n	"	"	
08·526		08·3	2	"	"	61·4
* 07·829			3	"	"	67·6
07·698	07·70	07·72	0	"	"	68·9
07·373			0	"	"	72·3
* 06·942	06·94	06·7	3	"	"	76·8
05·910			0	"	"	87·5
* 05·524			2	"	"	91·5
05·382	05·38	05·2	2	"	"	92·9
04·570			2	"	"	32201·4
04·070			0	"	"	06·5
	03·51	03·3	2	"	"	12·3
	02·50	02·5	1	"	"	25·4
		02·2	1	"	"	
		01·7	1	0·87	"	
	01·59	01·4	1	"	"	32·3
* 00·953	3000·95	3000·95	4	"	"	38·9
		99·8	1	"	"	
*3099·390	99·39	99·40	5	"	"	55·2
98·954			0	"	"	58·0
	98·05	97·9	2	"	"	63·0
* 97·706	97·71	97·6	4	"	"	72·7
*		97·2	1	"	"	
* 96·672	96·67	96·65	6	"	"	83·6
96·062		96·0	0	"	"	89·9
95·640			0	"	"	94·3
* 94·500	94·64	94·5	2	"	"	32306·2
	93·01			"	"	

\* Rowland and Tatnall: 3124·480, 3124·279, 3118·799, 3118·182, 3112·792, 3112·031, 3110·650, 3107·825, 3106·954, 3105·523, 3100·945, 3099·390, 3097·708, 3097·337, 3096·669, 3094·507.

## RUTHENIUM—continued.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuum
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
3092.351			0	0.87	9.2	32328.6
92.085			0	"	"	31.4
* 91.974		3091.8	2	"	"	35.0
91.004			2	"	"	42.7
	3090.54	90.5	1	"	"	47.6
* 90.341	90.34		2	"	"	49.7
* 89.915	89.92	89.7	4	"	"	54.1
* 89.252	89.25	89.2	4	"	"	61.1
88.362			0	"	"	70.4
88.177	88.18	88.1	2	"	"	72.3
88.050			0	"	"	73.7
87.039			2	"	"	84.2
86.888			1	"	"	85.9
86.631	86.63		2	"	"	88.6
* 86.181	86.18	86.0	4	"	"	93.3
85.597			0	"	"	99.4
84.728			0	"	"	32408.6
* 84.631		84.5	2	"	"	09.6
* 83.252		83.0	3	"	9.3	24.0
81.946	81.95	81.7	0	"	"	37.7
81.489	81.49	81.3	0	"	"	42.5
81.218			1	"	"	45.4
* 81.009	81.01		4	"	"	47.7
80.292		80.3	4	"	"	55.2
79.953		80.1	0	"	"	63.3
	79.27	79.1	1	"	"	65.9
78.209			1	"	"	77.1
77.657			2	"	"	82.9
77.175	77.18	77.0	2	"	"	88.0
* 76.886		76.8	2	"	"	91.1
75.412	75.41	75.3	1	"	"	32506.6
* 73.440	73.50		4	"	"	27.5
	72.42	72.3	2	"	"	38.3
71.824			0	"	"	44.6
* 71.721			0	"	"	45.7
71.586		71.5	2	"	"	47.1
		70.6	1	"	"	
		70.3	1	"	"	
69.289			2	"	"	71.5
* 68.355	68.36	68.2	4	"	"	81.4
		67.5	1	"	"	
		66.4	2	"	"	
* 64.958	64.96	64.95	4	"	"	32617.6
		63.3	1	"	"	
62.155	62.16	62.0	2	0.86	"	47.3
	60.67	60.4	2	"	"	63.2
60.346	60.37	60.2	0	"	"	66.6
* 59.284	59.28	59.1	3	"	"	78.3
* 58.909			1	"	"	82.1
58.762	58.76	58.6	2	"	"	83.6
57.468	57.47	57.2	3	"	"	97.5
56.971	56.97	56.92	0	"	"	32702.8

\* Rowland and Tatnall: 3091.980, 3090.348, 3089.916, 3089.259, 3086.182, 3084.637, 3083.257, 3081.010, 3076.883, 3073.442, 3071.711, 3068.363, 3064.951, 3359.275, 3058.891.



RUTHENIUM—*continued*.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
3056·877			0	0·86	9·3	32703·8
56·192			4	"	"	11·1
* 55·042	3055·04		4	"	"	23·5
		3054·8	2	"	"	
		54·6	1	"	"	
53·450			0	"	"	40·4
52·445			1	"	9·4	51·2
51·974			0	"	"	56·3
51·704			2	"	"	59·2
50·504			0	"	"	72·1
50·309		50·3	1	"	"	74·1
	49·32	49·32		"	"	84·8
49·174			0	"	"	86·4
* 48·897	48·90	48·7	4	"	"	89·3
* 48·606	48·61	48·4	4	"	"	92·5
48·442			0	"	"	94·2
	47·88	47·6	2	"	"	32800·3
47·108		47·0	0	"	"	08·6
46·356	46·36	46·1	2	"	"	16·7
46·114			2	"	"	19·3
* 45·833	45·83	45·6	4	"	"	22·3
45·630			0	"	"	24·5
		44·5	1	"	"	
44·077			0	"	"	41·2
43·161			1	"	"	51·1
* 42·953	42·95	42·7 Ir	2	"	"	53·4
* 42·598	42·60	42·3	3	"	"	57·2
42·025			1	"	"	63·4
* 40·418	40·42	40·2	3	"	"	80·9
40·071	40·07	39·9	2	"	"	84·6
39·586			0	"	"	90·3
38·851		38·6	0	"	"	97·8
* 38·289		38·1	2	"	"	32903·9
38·078		37·9	2	"	"	06·0
37·845		37·0	2	"	"	08·7
36·580	36·58	36·53	1	"	"	22·3
	35·93	35·6	2	"	"	29·4
35·578		35·3	3	"	"	33·2
* 34·167	34·17	33·8	4	"	"	48·4
* 33·562	33·56	33·4	4	"	"	55·1
	33·16	33·0	1 <sub>n</sub>	"	"	59·4
32·771	32·77	32·3	0	"	"	63·7
32·026		31·5	2	"	"	71·6
		31·1		"	"	
30·890		29·2	2	"	"	84·0
30·801		30·7 Os	2	"	"	84·2
	29·04	28·9		"	"	33004·2
28·785			0	"	"	07·1
27·910	27·91	27·7	0	"	"	16·7
27·678			0	"	"	19·2
27·361			0	"	"	23·2
27·195	27·20	27·0	2	"	"	24·5
		26·7	1	"	"	

\* Rowland and Tatnall: 3055·039, 3048·900, 3048·603, 3045·828, 3042·944, 3042·587, 3040·420, 3038·284, 3034·169, 3033·564.

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
3025·212			0	0·86	9·5	33046·1
	3024·0	3023·7	1	"	"	59·3
	23·05	22·8		0·85	"	69·7
	22·72	22·5	1	"	"	73·4
* 20·989	20·99	20·7	2	"	"	93·5
		20·5	1	"	"	99·1
20·360			0	"	"	33104·4
19·876	19·88	19·6	0	"	"	08·9
19·472		19·2	2	"	"	20·8
	18·38	18·3 Os	2b	"	"	
18·158	18·16		2	"	"	23·3
		17·6	2	"	"	
17·356	17·36	17·32	5	"	"	32·1
16·818			0	"	"	38·0
	16·10	15·8	2	"	"	45·8
	15·60	15·3	2	"	"	51·4
		14·5	1	"	"	
14·312	14·3	14·3	0	"	"	65·6
* 13·477	13·48	13·3	3	"	"	74·8
13·172			0	"	"	78·0
* 13·040			3	"	"	79·6
12·003		12·0	0	"	"	91·0
10·623	10·62	10·3	2	"	"	33206·2
09·798	09·80		0	"	"	15·3
		09·2	1	"	"	25·1
* 08·911		08·7	2	"	"	27·5
08·695			0	"	"	30·9
* 08·387		08·2	2	"	"	35·2
	08·00	07·8	1	"	"	
		07·2	1	"	"	
* 06·708	06·71	06·75	4	"	"	49·4
06·094		05·8	2	"	"	56·2
		05·1	2	"	"	
04·708		04·6	2	"	"	71·6
02·600	02·60	02·4	2	"	"	94·9
02·188			0	"	"	99·5
* 01·756	01·76	01·6	3	"	"	33304·3
		01·0	1	"	"	
00·341	00·57	00·3	2	"	"	17·5
	00·00			"	"	
		2999·6	2	"	"	34·8
2999·011	2999·01	98·99	1	"	"	41·1
* 98·446	98·45	98·2	3	"	"	55·0
	98·09	98·0	1	"	"	48·9
* 97·743	97·74	97·6	2	"	"	53·5
	97·34	97·4	1	"	9·6	58·3
* 97·011	96·89	96·6	1	"	"	63·4
	96·44	96·2	1	"	"	68·1
	96·01	95·8	1	"	"	78·4
* 95·083	95·08	94·7	5	"	"	84·5
	94·54	94·5	1	"	"	
		93·6	1	"	"	
* 93·387		93·1	3	"	"	97·4

\* Rowland and Tatnall: 3020·985, 3013·468, 3013·030, 3008·906, 3008·366, 3006·699, 3001·751, 2998·458, 2997·730, 2997·536, 2997·006, 2995·077, 2993·385.

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2993·070			1	0·85	9·6	33400·9
	2992·48	2992·5	1			07·5
92·080	92·08	92·0	0	"	"	12·0
	91·71	91·66	8	"	"	16·2
90·413			2	"	"	30·5
		90·0	1n	"	"	
* 89·770		89·4	2	"	"	37·9
89·451			2	"	"	40·4
* 89·079	89·06	89·02	0	"	"	45·5
88·224		88·0	1	"	"	55·1
88·047			1	"	"	57·1
86·453	86·45	86·5	1	"	"	74·9
86·104			0	"	"	78·8
	85·78	85·5	1	"	"	82·5
	85·08	84·7	1	"	"	90·3
	83·74			"	"	
* 82·045	82·05	82·0	4	0·84	"	33524·4
81·080	81·08	80·8	0	"	"	35·3
* 80·065	80·07	80·05	3	"	"	46·7
* 79·847	79·85	79·80	3	"	"	49·2
78·760	78·76	78·72	2	"	"	61·4
77·596	77·60	77·4	0	"	"	74·5
77·346	77·35	77·25	2	"	"	77·4
* 77·048		76·8	3	"	"	80·8
* 76·707	76·71	76·62	4	"	"	84·6
75·253			1	"	"	33601·0
	74·79	74·7	1	"	"	06·2
* 74·454	74·45	74·4	2	"	"	10·0
* 74·099			3	"	"	14·0
73·743	73·74	73·7	0	"	"	18·1
		73·3	1	"	"	
	73·08	73·0	2	"	"	25·5
72·594	72·59	72·4	0	"	"	31·1
	71·10	70·9	1	"	"	48·0
		70·6	1	"	"	
		70·5	1	"	"	
69·850	69·85		0	"	9·7	62·0
69·069	69·07	68·8	4	"	"	70·9
68·564	68·56		4	"	"	76·6
68·233	68·11	67·9	0	"	"	80·4
67·456			2	"	"	91·2
	66·98			"	"	
66·674	66·67	66·3	1	"	"	98·1
65·820		65·72	1	"	"	33707·8
65·674	65·67		3	"	"	09·4
65·286	65·29	65·2	4	"	"	13·9
64·415			0	"	"	23·7
63·829			3	"	"	30·4
63·523	63·52	63·50	2	"	"	33·9
62·705			0	"	"	43·2
62·442			0	"	"	46·2
61·803	{ 62·08	62·0	2n	"	"	60·3
	{ 61·60			"	"	

\* Rowland and Tatnall: 2989·768, 2989·061, 2982·048, 2980·056, 2979·834, 2977·037, 2976·700, 2974·457, 2974·095.

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2961.097			3	0.84	9.7	33761.6
	2960.35	2960.2	2	"	"	70.1
59.855	59.86	59.6	2	"	"	75.7
58.993			0	"	"	85.6
58.118			3	"	"	95.5
57.297			0	"	"	33805.0
55.960			0	"	"	20.3
55.714			0	"	"	23.0
55.463			2	"	"	25.9
		55.0	1	"	"	
54.594	54.59	54.7	4	"	"	35.8
		54.4	2	"	"	
54.371	54.20	54.0	0	"	"	38.5
53.116			0	"	"	52.7
	52.78	52.6	1	"	"	56.6
52.599			2	"	"	58.7
	52.36	52.2	2	"	"	61.3
51.516		51.3	2	"	"	71.2
50.650		50.5	1	"	"	81.1
50.080	50.08	50.0	0	"	"	87.5
49.612	49.61	49.5	4	"	"	93.0
		49.2	1	"	"	
		48.7	1	"	"	
	48.47	48.2	1	"	"	33906.1
	47.72	47.7	1	"	"	14.8
47.102	47.10	47.0	4	"	"	21.9
46.670			0	"	"	26.3
45.775	45.78	45.82	4	"	"	37.2
45.591			0	"	9.8	39.2
	45.20	45.0	2	"	"	43.7
44.294			0	"	"	54.2
44.035	44.04	43.9	3	"	"	57.1
43.593	43.59		1	"	"	62.3
42.823			0	0.83	"	71.2
42.366	42.37	42.40	1	"	"	76.4
		41.6	1	"	"	
		41.0	ln	"	"	
40.474		40.3	3	"	"	98.3
40.057		39.8	3	"	"	34003.1
39.796			0	"	"	06.2
39.247	39.25	39.0	2	"	"	12.5
37.679			0	"	"	30.7
37.448			1	"	"	33.3
	37.20	37.0	1	"	"	36.2
36.591			0	"	"	43.3
36.380			0	"	"	45.7
36.131			2	"	"	47.8
	35.67	35.5	2	"	"	54.0
34.638			0	"	"	65.9
34.309			2	"	"	69.7
33.367	33.37	33.38	0	"	"	80.7
		32.6	1	"	"	
	31.35	31.2	2	"	"	34104.1
	29.87	29.6	1	"	"	21.7
29.027	29.03	29.1	0	"	"	31.1
28.608	28.61	28.5	2	"	"	36.1



RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
	2928.27			0.83	9.8	34140.1
2927.858	27.73	2927.72	0	"	"	44.3
27.232			2	"	"	52.2
26.913			0	"	"	55.9
	26.69	26.5	1	"	"	58.5
25.890	25.89		0	"	"	67.8
25.685		25.5	0	"	"	70.2
25.189			0	"	"	76.0
24.760			0	"	"	81.0
	24.20	23.9	2	"	"	87.5
	23.40	23.1	1	"	"	96.9
	22.50	22.3	2	"	"	34207.4
	21.95	21.8	1	"	9.9	19.0
21.276			0	"	"	21.7
21.068	21.07		2	"	"	24.1
		20.5	1	"	"	
20.369			1	"	"	32.3
19.723	19.73	19.6	4	"	"	39.9
19.276			0	"	"	45.1
	18.76	18.5	2	"	"	51.2
17.880	17.88	17.9	2	"	"	61.6
		17.5	1	"	"	
17.353			0	"	"	67.6
17.249			2	"	"	68.9
16.351	16.47	16.48	6	"	"	79.1
15.736			2	"	"	86.7
14.403			2	"	"	34302.4
	14.10	14.0	2	"	"	06.0
		13.5	1	"	"	
13.286	13.29	13.3	3	"	"	15.6
		13.0	1	"	"	
12.866			0	"	"	20.5
12.555	12.56		0	"	"	24.2
12.451	12.45		0	"	"	25.4
10.542			2	"	"	48.0
	10.10			"	"	
09.352	09.35	09.95	1	"	"	64.0
		09.5	1	"	"	
		09.1 Os ?	2	"	"	
08.590			0	"	"	71.0
		08.0	ln	"	"	
		07.1	ln	"	"	
		06.6	1	"	"	
06.424	06.42	06.3	3	"	"	96.6
05.952		05.9	1	"	"	34402.2
05.756	05.76		3	"	"	04.5
04.825		04.7	0	"	"	15.6
		03.7	1	"	"	
		03.3	1	"	"	
03.180		03.0	2	"	"	34.9
02.969		02.8	1	"	"	37.6
02.223	02.22	02.10	1	"	"	46.4
01.890	01.74	01.8	1	"	"	50.4
	00.63	00.7	2	"	"	65.4
		99.9	1	"	"	
2899.820	2899.70	2899.7	1	"	"	75.0

## RUTHENIUM—continued.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2898·845		2898·7	1	0·83	9·9	34486·6
98·650		98·5	3	"	"	88·9
	2898·40			"	"	
		98·0	2	"	"	
97·820	97·82		1	"	10·0	34510·8
96·638		96·7	3	"	"	12·8
95·925		95·9	1	"	"	21·3
95·554			0	"	"	25·7
		94·0	1	"	"	
93·844	93·84		0	"	"	46·1
		92·8	2	"	"	
92·654	92·65	92·5	4	"	"	60·4
		92·2	1	"	"	
	92·00	91·9	1	"	"	68·1
91·762		91·5	2	"	"	71·0
91·242	91·24		2	"	"	77·1
		90·7	1	"	"	
		89·9	1n	"	"	
		89·6	1	"	"	
89·543	89·54		0	"	"	97·5
88·739		88·8	2	0·82	"	34607·2
88·112	88·11	88·2	2	"	"	14·7
87·224	87·22	87·3	0	"	"	25·3
86·646	86·64	86·7	4	"	"	32·3
	85·60	85·6	1	"	"	44·8
		85·1	1	"	"	
84·601	84·60	84·7	2	"	"	56·8
83·701	83·70	83·8	3	"	"	67·6
		83·3	1	"	"	
82·697			2	"	"	79·7
82·222	82·22	82·24	2	"	"	85·4
81·373	81·37	81·5	1	"	"	95·7
		81·0	1	"	"	
80·637	80·64	80·6	0	"	"	34704·5
	80·24	80·3	2	"	"	09·3
79·853		80·0	3	"	"	14·0
79·466			0	"	"	18·7
	79·20	79·3	2	"	"	21·8
		78·3 Pd	1	"	"	
77·930	78·04	78·1	2	"	"	37·2
		77·5	1	"	"	
77·197		77·3	2	"	"	46·0
		76·9	1	"	"	
		76·6	1	"	"	
		76·3	1	"	"	
		75·8	1	"	"	
		75·5	1	"	"	
75·104	75·10	75·2	5n	"	"	71·4
		74·7	1	"	"	
74·161			2	"	"	82·8
	73·83	73·9	2	"	"	86·8
	73·34	73·5	2	"	"	92·7
72·468		72·5	2	"	"	34803·2
71·756		71·8	4	"	10·1	11·9
	71·57	71·7	2	"	"	14·0
71·296			3	"	"	17·3

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
		2870.8	2	0.82	10.1	
	2870.53	70.6	1 <sub>n</sub>	"	"	34826.8
2870.322			2	"	"	29.2
69.047	69.05	69.1	0	"	"	44.8
68.662			0	"	"	49.3
68.426	68.43	68.5	2	"	"	52.2
68.286			2	"	"	53.9
	67.20	67.3	1	"	"	67.1
66.743	66.74	66.9	5	"	"	72.7
	66.41	66.6	2	"	"	76.7
	66.19	66.4	2	"	"	79.4
	65.65	65.7	2	"	"	86.0
64.726			0	0.81	"	97.2
	63.33	63.5	2	"	"	34914.2
63.112		63.1	2	"	"	16.8
62.963	62.96		0	"	"	22.8
		62.5	1 <sub>n</sub>	"	"	
61.833		62.0	1	"	"	32.5
61.508	61.54	61.6	5	"	"	36.5
	61.17	61.3	1	"	"	40.6
	60.95	61.1	1	"	"	43.3
60.491	60.49		0	"	"	48.9
60.114	60.11	60.2	4	"	"	53.5
		60.0	2	"	"	
		59.9	2	"	"	
	59.65	59.6	1 <sub>n</sub>	"	"	
58.693	58.69	59.1	0	"	"	68.8
		58.0	2	"	"	
	57.88			"	"	
57.770			0	"	"	82.2
57.367	57.37	57.4	1	"	"	87.2
	56.67	56.7	2	"	"	95.7
		56.3	1	"	"	
56.153		56.1	2	"	"	35002.0
55.995		55.9	2	"	"	04.0
55.454	55.45	55.5	0	"	"	10.6
	55.01	55.1	1	"	"	16.1
54.820	54.82	54.9	0	"	"	18.4
54.465		54.3	0	"	"	22.8
54.173	54.17		4	"	"	26.3
53.433	53.43		0	"	"	35.4
	53.28	53.3	2	"	"	37.3
		52.7	1	"	"	
		52.4	1	"	"	
51.225			1	"	"	62.5
	50.86	50.8	2	"	"	67.0
		50.3	1 <sub>n</sub>	"	"	
	49.73	49.7	2	"	"	82.2
49.399	49.40	49.4	0	"	"	85.0
48.688		48.8	1	"	"	93.8
	47.72	47.8	1	"	10.2	35105.6
	47.25	47.3	1	"	"	11.3
		46.9	1	"	"	
46.662		46.7	0	"	"	18.6
46.430		46.5	1	"	"	21.5
	45.3			"	"	

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
	2844·86	2844·9	2	0·81	10·2	35156·4
		43·9	1			
		43·4	1	"	"	
2843·277			2	"	"	60·4
42·859		43·0	0	"	"	65·6
		42·8	1	"	"	
42·651			1	"	"	68·2
41·777	41·78	41·81	2	"	"	79·0
	41·23	41·3	2	"	"	85·8
40·657	40·66	40·8	2	"	"	92·9
		39·9	1	"	"	
	39·52	39·6	1	"	"	35207·0
	39·16	39·1	2	"	"	11·6
38·729	38·73	38·9	2	"	"	16·8
		38·0	1	"	"	
37·384	37·28		0	"	"	33·5
36·684	36·68	36·7	2	"	"	42·2
		36·5	1	"	"	
36·254		36·4	2	"	"	47·6
	35·77			"	"	
	34·52			"	"	
34·107		34·2	3	"	"	74·3
	33·97	34·0	2	"	"	76·0
	33·64			"	"	80·1
32·755		32·9	0	"	"	81·1
	32·00	32·1	2	"	"	35300·5
31·280			0	"	"	09·7
30·815		30·8	1	"	"	15·3
		30·3	1	"	"	
		30·1	1	"	"	
		29·6	1	"	"	
		29·4	2	"	"	
29·253	29·25		2	"	"	44·8
27·969	27·97	28·1	4	"	"	50·9
27·627	27·63	27·7	0	"	"	55·1
	27·19	27·3	1	"	"	60·6
	26·81	26·9	2	"	"	65·4
		26·7	1	"	"	
	26·36	26·4	2	"	"	71·0
	25·62	25·6	2	"	"	80·3
	25·20	25·3	2	"	"	85·5
24·866			0	0·80	"	89·7
24·004		24·3	0	"	"	35400·5
	23·33	23·4	2	"	10·3	08·8
22·912		22·9	0	"	"	14·1
22·659	22·66	22·62	2	"	"	17·3
22·371		22·3	0	"	"	21·0
22·142			2	"	"	23·7
21·504	21·50	21·48	0	"	"	31·8
21·279			1	"	"	34·5
		20·8	1n	"	"	
19·667			0	"	"	54·8
19·062		19·2	2	"	"	62·4
18·913			0	"	"	4
18·460	18·46	18·6	4	"	"	0·0
	17·74	17·7	2	"	"	80·3



RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2817·192		2817·3	3	0·80	10·3	35485·9
		16·7	1n	"	"	
		15·9	1	"	"	
15·410		15·6	0	"	"	35508·5
	2815·18	15·2	1	"	"	11·4
		14·7	2	"	"	
13·807	13·81	13·78	0	"	"	28·7
	13·44	13·38	4	"	"	33·3
12·925		13·0	2	"	"	48·3
		12·9	1	"	"	
	12·06	12·2	1	"	"	50·8
	11·66	11·8	1	"	"	55·9
11·360			0	"	"	59·6
10·788	10·79	10·79	0	"	"	66·9
10·645	10·65	10·5	3	"	"	68·7
10·131	10·13	10·3	4	"	"	75·2
08·335		08·5	0	"	"	97·9
	07·7	07·7	2	"	"	35606·0
	07·34	07·5	2	"	"	10·6
06·845	06·85	06·85	0	"	"	16·9
		06·5	1n	"	"	
	04·94	05·1	2	"	"	41·1
		04·0	1	"	"	
	03·76	03·7	1	"	"	56·1
03·593		03·4	1	"	"	58·2
02·907	02·91	03·1	2	"	"	66·9
02·260	02·26	02·4	0	"	"	75·1
		01·6	1	"	"	
		01·2	1	"	"	
00·785	00·79	00·7	1	"	"	94·0
		00·6	1	"	"	
00·243			0	"	"	35701·9
	00·03			"	"	
	2799·71	2799·7	1	"	"	07·7
		99·4	1	"	"	
	98·91	99·0	2	"	"	
	97·91	97·9	1	"	10·4	17·8
	97·20	97·3	1	"	"	30·6
2796·652	96·65	96·6	0	"	"	39·6
	96·10	96·2	1	"	"	46·6
		95·7	1	"	"	53·7
95·464	95·46	95·6	0	"	"	61·8
	94·42	94·4	2	"	"	75·2
		93·2	1	"	"	
92·746			2	"	"	
92·418	92·42	92·4	2	"	"	96·7
91·164	91·16	91·3	0	"	"	35800·9
90·695			0	"	"	04·1
	90·28	90·3	2	"	"	23·0
89·720	89·72	89·6	0	"	"	28·3
	88·84	88·8	2	"	"	35·5
		88·5	1	"	"	46·8
87·930	87·93	87·95	3	"	"	58·5
	87·35	87·5	2	"	"	65·7
	86·50	86·5	1	"	"	66·9
	85·90	85·92	4	"	"	84·6

RUTHENIUM—*continued*.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\lambda -$ $\lambda$	
2785·746			1	0·80	10·4	35886·6
	2785·29	2785·3	2	"	"	92·4
84·978			0	"	"	96·5
84·625	84·62	84·6	0	"	"	35901·1
	83·85	83·9	2	0·79	"	11·1
		83·0	1	"	"	
82·305	82·31	82·4	1	"	"	21·0
		81·0	2 <sub>n</sub>	"	"	
80·858	80·86		2	"	"	49·7
		80·5	1	"	"	
		80·0	1	"	"	
	79·54	79·6	2	"	"	66·7
		79·2	2	"	"	
79·081	79·08		0	"	"	72·6
	78·54	78·48	6	"	"	79·7
		78·2	1	"	"	
77·629	77·63	77·8	0	"	"	82·6
		77·6	2	"	"	
		76·5	1	"	"	
76·009		75·9	1	"	"	36012·5
75·723	75·72	75·70	0	"	"	16·2
75·288		75·3	1	"	"	21·9
		75·2	1	"	"	
74·589		74·7	2	"	"	31·0
		74·4	1	"	"	
	74·25			"	"	
		73·2	1	"	"	
73·068		72·9	0	"	"	50·8
72·716	72·72		0	"	"	55·3
	72·55	72·58	4	"	"	57·5
		72·2	1	"	"	
	71·99	72·1	1	"	"	64·8
	71·59	71·6	1	"	"	70·0
	71·15	71·3	2	"	"	75·7
70·805		70·9	2	"	"	80·2
70·399	70·40	70·5	0	"	"	85·5
69·993			0	"	"	90·8
69·024	69·02	69·02	4	"	10·5	36103·2
68·032			0	"	"	16·2
	67·66	67·7	1	"	"	21·1
		67·5	1	"	"	
		67·1	1	"	"	
	66·66	66·7	2	"	"	34·1
66·323			0	"	"	38·5
	66·00	66·1	2	"	"	42·8
65·530	65·53	65·55	2	"	"	48·8
	65·24	65·25	4	"	"	52·7
64·824		65·0	2	"	"	58·2
64·005		64·2	1	"	"	68·9
63·513	63·53	63·6	4	"	"	75·3
63·232		63·3	2	"	"	79·0
		62·9	1	"	"	
62·400		62·4	2	"	"	89·9
	62·17	62·2	1	"	"	93·0
	61·60	61·7	1	"	"	36201·4
		61·5	1 <sub>n</sub>	"	"	

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2760·268	2760·88	2760·9	2	0·79	10·5	36209·8
	60·27	60·2	0	"	"	17·8
		59·8	1	"	"	
	59·35	59·3	1	"	"	29·9
		59·0	2	"	"	
58·104	58·10	58·5	1	"	"	46·3
57·912		58·0	0	"	"	48·8
		57·5	1	"	"	
57·175		57·1	0	"	"	58·5
		56·7	1	"	"	
		56·6	1	"	"	
	56·46	56·5	1	"	"	67·9
		56·0	1	"	"	
	55·80 Fe	55·9	1	"	"	
		55·5	1	"	"	
	55·30	55·3	2	"	"	83·2
		54·3	1	"	"	
53·543	53·54	53·6	2	"	"	36306·3
52·868	52·87	52·94	2	"	"	15·2
52·548	52·55	52·59	2	"	"	19·5
	52·14	52·3	2	"	"	24·8
51·698		51·9	0	"	"	30·7
		51·6	1	"	"	
		51·0	1	"	"	
50·452		50·6	0	"	10·6	47·0
49·923			0	"	"	54·1
	49·66	49·7	2	"	"	57·5
	49·26	49·4	2	"	"	62·8
		49·2	2	"	"	
		48·7	1	"	"	
		48·3	ln	"	"	
	48·03	48·08	4	"	"	79·1
	47·62	47·7	1	"	"	84·5
46·991	47·00	47·1	0	"	"	92·9
	46·75	46·8	2	"	"	96·1
46·169	46·17	46·2	0	"	"	36403·9
	45·90	45·98	4	"	"	07·3
45·343			0	"	"	14·7
	45·22	45·22	4	"	"	16·3
44·821			0	"	"	21·6
44·541	44·54	44·62	2	"	"	25·3
44·022	44·02	44·10	2	"	"	32·3
	43·57	43·62	4	"	"	38·3
		43·3	ln	"	"	
		42·6	2	"	"	
	42·15	42·2	1	"	"	57·1
		41·7	ln	0·78	"	
		41·5	1	"	"	
		41·4	ln	"	"	
		40·7	2	"	"	
40·327		40·3	1	"	"	81·4
40·085			0	"	"	84·6
	39·68 Fe	39·8	ln	"	"	
39·311	39·40	39·4	4	"	"	94·9
		39·1	1	"	"	

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Hasehek		$\lambda +$	$\frac{1}{\lambda}$	
2738·983		2738·9	0	0·78	10·6	36501·3
		38·3	1	"	"	
		38·0	2	"	"	
	2737·87	37·8	2	"	"	14·1
	37·66			"	"	
36·917	36·92	36·98	0	"	"	26·9
36·412	36·54	36·6	0	"	"	33·8
35·806	35·81	35·9	2	"	"	41·7
34·438	34·44	34·44	3	"	"	59·9
	33·68	33·7		"	"	70·1
33·167		33·2	0	"	"	77·0
	32·83	32·8		"	"	79·5
		32·5 Ir ?		"	"	
32·011		32·1	0	"	"	92·5
	31·48	31·5		"	"	99·6
31·028		31·1	2	"	"	36605·7
	30·79	30·7		"	"	08·8
30·416	30·42	30·5	2	"	"	13·9
30·115			0	"	"	17·9
29·540	29·54	29·5	2	"	"	25·6
	29·04	28·9		"	"	32·3
	27·74			"	"	
		27·4		"	"	
27·063	27·06	27·1	0	"	10·7	58·8
		26·6		"	"	
25·549	25·55	25·55	4	"	"	79·2
	24·95	24·95		"	"	87·2
		24·2		"	"	
24·153		24·0		"	"	97·9
		23·6		"	"	
	23·10	23·3		"	"	36712·1
22·903		22·8	0	"	"	14·8
22·760	22·76	22·6	3	"	"	16·8
22·493			0	"	"	20·3
21·937			0	"	"	35·4
21·653		21·7	3	"	"	31·7
		21·3		"	"	
		20·4		"	"	
19·838	19·84	19·8	0	"	"	56·2
19·610	19·61	19·7	5	"	"	59·3
18·919	18·92	19·0	0	"	"	68·6
	17·93	18·0		"	"	82·0
17·510	17·51	17·45	2	"	"	87·7
17·100			0	"	"	93·2
		16·8		"	"	
	16·23	16·3		"	"	36805·0
	16·15			"	"	
15·595		15·6	2	"	"	13·6
15·326		15·3 Rh	0	"	"	17·3
		14·3		"	"	
		14·0		"	"	
13·824	13·66	13·7	1	"	"	37·7
13·272	13·14	13·2	2	"	"	45·1
12·967			0	"	"	49·3
12·493	12·49	12·43	4	"	"	55·7
12·169			0	"	"	60·2



RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
		2711.9		0.78	10.7	
2710.321	2710.32	11.2		"	"	
		10.3	0	"	"	36885.3
		10.0		"	"	
09.851			0	"	"	91.7
09.291	09.29	09.3	2	"	"	99.3
09.157		09.1	0	"	"	36901.2
08.930		08.7	0	"	"	04.2
08.054		08.2	2	"	"	16.2
	07.41	07.5	1n	"	"	25.0
		07.4	2	"	"	
		06.6	1	"	"	
		05.6 Rh	1n	"	"	
05.416			0	"	"	52.2
	04.99	04.9	1n	"	"	58.0
	04.65	04.7	2	"	"	62.7
	04.31	04.4	1	"	"	67.3
03.891		04.0	2	"	"	73.1
03.403		03.7	0	"	"	79.7
03.221		03.0	0	"	"	82.3
02.916	02.92	02.8	4	"	"	86.4
01.434		01.5	4	"	"	87.0
	01.09	01.2	2	"	10.8	97.6
00.772	00.77	00.8	0	"	"	37015.6
00.578			1	"	"	18.3
	00.32	00.3	2	"	"	21.8
2699.957		00.0	1	"	"	26.8
	2699.42	2699.5	1	"	"	34.2
	98.80			0.77	"	
	98.23			"	"	
98.161			0	"	"	51.4
			1	"	"	
97.595		97.8	0	"	"	59.3
		97.4	2	"	"	
	97.18			"	"	
96.653		96.7	0	"	"	72.2
	94.85	94.8	1	"	"	97.0
		94.5	1	"	"	
	94.25	94.3	1	"	"	37105.3
		93.9	1	"	"	
93.750	93.75	93.6	0	"	"	12.1
93.392	93.39		2	"	"	17.1
92.199 ?	92.20	92.08	4	"	"	33.5
90.904			0	"	"	51.4
90.487	90.49	90.4	1	"	"	57.2
	89.51	89.6	1	"	"	70.7
88.969	88.97		1	"	"	78.2
88.668			1	"	"	82.3
88.216	88.22	88.4	1	"	"	88.6
87.580	87.58	87.7	1	"	"	97.4
87.214	87.21	87.3	1	"	"	37202.4
	86.94	87.1	2	"	"	06.3
86.375	86.38	86.5	4	"	"	14.0
	85.94	86.1	1	"	"	20.1
	85.57	85.8	1	"	"	25.2
85.242	85.24	85.4	0	"	"	29.7

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2684.540	2684.69	2684.9	0	0.77	10.8	47239.5
84.172		84.3 Rh	1	"	"	44.6
83.756			1	"	"	50.4
	82.84	82.9	ln	"	"	63.1
		81.5	1	"	"	
	80.66	80.7	2	"	"	93.4
		80.0	1	"	"	
79.843		79.7	1	"	"	37304.8
	79.54			"	"	
78.837	78.84	78.79	4	"	10.9	18.7
78.267	78.27	78.3	0	"	"	27.7
77.967			0	"	"	30.9
77.406		77.5	0	"	"	38.7
77.057		77.0	0	"	"	43.5
	76.86			"	"	
76.430		76.4	2	"	"	52.3
	76.27			"	"	
	75.58	75.7	2	"	"	64.2
75.273	75.27	75.2	0	"	"	68.4
	74.27	74.4	2	"	"	82.5
73.930		73.7	0	"	"	87.8
73.691		73.7	2	"	"	90.6
73.550			2	"	"	92.5
73.089	73.09	73.2	0	"	"	99.0
		72.6	2	"	"	
72.451	72.45	72.5	0	"	"	37407.9
70.813			0	"	"	30.9
70.586	70.60	70.7	0	"	"	33.9
		69.6	2	"	"	
	69.24			"	"	
	68.71	68.7	1	"	"	60.4
68.421			0	"	"	64.5
68.042		68.1	1	"	"	69.8
	67.89			"	"	
67.479	67.48	67.35	1	"	"	77.6
65.803			1	"	"	37501.2
65.542	65.54	65.4	0	"	"	04.9
65.227		65.1	0	"	"	09.4
64.833	64.83		4	"	"	14.9
	64.65			"	"	
	63.85	63.6	1	"	"	28.8
	62.94	63.0	2	"	"	41.6
	62.36	62.3	2	"	"	50.2
61.937			0	"	"	55.7
61.690	61.69	61.64	4	"	"	59.2
61.249	61.25	61.20	2	"	"	65.4
60.673		60.8	0	"	"	71.6
	59.64	59.8	2	"	"	88.2
		59.5	ln	"	"	
58.862			0	"	"	99.2
58.482		58.4	2	"	"	37604.6
	58.28			"	"	
57.249	57.25	57.3	1	"	"	22.0
56.776			1	"	11.0	28.6
56.641			1	"	"	30.5
56.328	56.33	56.35	1	"	"	35.0

RUTHENIUM—*continued.*

Wave-length (Kaysar) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2655.292			1	0.77	11.0	37649.6
55.193			0	"	"	51.0
54.898	2654.90	2655.1	0	0.76	"	55.2
54.563		54.7	0	"	"	60.0
		54.2	2	"	"	
	54.01			"	"	
53.776			1	"	"	71.2
53.240		53.2	1	"	"	78.8
	53.05			"	"	
		52.7	1	"	"	
52.240		52.3	0	"	"	93.0
	52.05			"	"	
51.936	51.94	52.0	4	"	"	97.3
51.603		51.7 Rh ?	0	"	"	37702.0
51.366	51.37	51.5	2	"	"	05.4
50.968	50.97		0	"	"	11.1
50.693		50.6	0	"	"	15.0
50.486	50.49	50.4	1	"	"	17.9
	50.21	50.2	1	"	"	21.8
50.076			0	"	"	23.8
49.608		49.7	2	"	"	30.4
48.872	48.87	48.95	2	"	"	40.9
48.706			0	"	"	43.3
48.535			1	"	"	45.7
47.019		48.1	1	"	"	53.1
47.394		47.5	2	"	"	62.0
		47.0	1	"	"	
46.715			0	"	"	71.7
46.087	46.09	46.1	2	"	"	80.7
		45.3	1	"	"	
44.711	44.71	44.7	0	"	"	37800.3
44.187			0	"	"	08.6
43.600	43.60	43.7	0	"	"	16.2
		43.3	2	"	"	
43.042	43.04	43.1	4	"	"	24.2
42.607		42.5	0	"	"	30.4
		42.3	1	"	"	
42.063	42.06		0	"	"	38.2
	41.72	41.7	2	"	"	43.1
41.549			0	"	"	45.6
40.413	40.41		2	"	"	61.9
	39.67	39.7	2	"	"	72.5
39.205		39.3	2	"	"	79.4
38.597	38.60	38.6	2	"	"	87.9
		38.5	1	"	"	
		38.2	1	"	"	
	36.95	36.9	1	"	"	37911.6
36.760		36.7	2	"	"	14.3
36.617	36.62		0	"	"	16.4
35.927	35.93	36.0 Pd	4	"	"	26.3
35.451	35.45	35.4	0	"	"	33.2
	33.93			"	"	
		33.7	1	"	"	
33.537			0	"	"	60.8
	32.85	32.9	2	"	"	70.7
32.584		32.5	1	"	"	74.5

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2632.210		2632.4	0	0.76	11.0	37979.9
31.657		31.7	1	"	11.1	87.8
		31.5	1	"	"	
	2631.22	31.3	2	"	"	794.1
30.314			1	"	"	38007.1
	30.19	30.2	2	"	"	09.0
30.010			0	"	"	11.6
	29.49	29.5	1	"	"	19.1
	28.91	28.9	2	"	"	27.5
28.621			0	"	"	31.6
28.375	28.38	28.3 Pd ?	4	"	"	35.2
	27.90			"	"	
27.737	27.74		1	"	"	44.5
		27.5	1	"	"	
	26.60	26.5	2	"	"	60.9
26.444			0	"	"	63.2
26.290		26.1	0	"	"	65.4
	25.95			"	"	
	25.59	25.6	1	"	"	75.6
		25.5	2	"	"	
25.168		25.2	0	"	"	81.7
	24.87	24.9	1	"	"	86.0
	24.35	24.3	1	"	"	93.6
23.914			1	"	"	99.9
	23.76	23.7	ln	"	"	38102.1
	23.51			"	"	
		23.1	1	"	"	
		22.9	1	"	"	
		22.4	ln	"	"	
	21.91	21.9	1	"	"	29.0
	21.46	21.4	1	"	"	35.6
21.173		21.2	0	"	"	39.8
20.713	20.71	20.8	2	"	"	46.4
20.154	20.15	20.2	0	"	"	54.6
19.745		19.8	2	"	"	60.5
	19.42	19.5	2	"	"	65.3
19.105		19.2	0	"	"	69.8
	18.68			"	"	
17.882		18.0	1	"	"	87.7
		17.6	1	"	"	
	17.29	17.2	2	"	"	96.3
	16.50	16.5	1	"	"	38207.9
		15.7	1	"	"	
15.179	15.18	15.2	2	"	"	27.2
	14.93	15.0	2	"	"	31.0
14.671		14.8 Pd	2	"	"	34.6
14.151	14.15	14.2	1	"	"	42.2
		14.0	ln	"	"	
	13.37	13.4	ln	"	"	53.6
13.143			0	"	"	57.0
12.990			0	"	"	59.2
	12.63	12.6	2	"	"	64.5
12.165	12.17	12.2	2	"	"	71.3
	11.99	12.0	1	"	"	73.9
	11.63	11.6	2	"	"	79.2
11.130		11.2	2	"	"	86.5



RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
	2610.18	2610.2	2	0.76	11.0	38300.3
2609.573	09.57	09.6	2	0.75	"	09.5
09.143	09.14	09.2	4	"	11.2	15.5
		08.5	1	"	"	
08.024	08.02	08.0	1	"	"	32.0
07.440			0	"	"	40.6
	07.18 Fe	07.0	1	"	"	
	06.40	06.4	2n	"	"	56.8
05.950		06.0	2	"	"	62.5
05.439		05.5	2	"	"	68.4
04.409	04.41	04.3	0	"	"	85.2
	03.43	03.4	1n	"	"	99.6
	03.00	03.0	1	"	"	38406.0
	02.49	02.4	2	"	"	13.5
01.553	01.55	01.6	2	"	"	27.3
01.392			0	"	"	29.7
00.840		00.7	0	"	"	37.9
	00.5			"	"	
	00.00	2599.9	1	"	"	50.3
	2599.53 Fe	99.6	1	"	"	
		99.5	1	"	"	
	98.99 Fe	99.0	2	"	"	
2598.681	98.68	98.6	0	"	"	69.8
	98.07	98.1	2	"	"	78.9
	97.84	97.7	1	"	"	82.3
97.417	97.42	97.3	1	"	"	88.5
96.043	96.04	96.0	0	"	"	38508.9
95.734			0	"	"	12.5
94.926		95.1	2	"	"	25.5
	94.65	94.6	1	"	"	29.6
	93.79	93.9	1n	"	"	42.4
		93.6	1n	"	"	
		93.3	1n	"	"	
		93.1	1n	"	"	
		92.3	1	"	"	
92.093			2	"	"	67.6
91.710			0	"	"	73.4
	91.44	91.5	2	"	"	77.4
91.201	91.20	91.3	2	"	"	80.9
91.087			1	"	"	82.6
89.886		89.9	0	"	"	38600.5
89.649	89.65	89.6	2	"	"	04.1
89.129		89.0	0	"	"	11.8
	88.08	88.1	1	"	11.3	27.3
87.413			0	"	"	37.3
	86.95	87.0	1n	"	"	44.4
86.157	86.16	86.0	0	"	"	56.1
85.815			0	"	"	61.2
85.412		85.6	1	"	"	67.2
84.211		84.4	2	"	"	85.2
83.131	83.13	83.2	2	"	"	38701.4
		83.1	1	"	"	
		82.7	1	"	"	
	82.48			"	"	
81.990		82.1	2	"	"	20.0
		81.6	1	"	"	

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2581·216	2581·23	2581·3 81·0	2 1	0·75	11·3	38730·1
80·883			2	"	"	35·1
80·316	80·32 80·08	80·4	0	"	"	43·6
79·879	79·94	79·8	0	"	"	50·2
79·623			2	"	"	54·0
79·309		79·3	1	"	"	58·7
79·071	79·10		2	"	"	62·4
78·653	78·65	78·8 78·4 77·5	2 1 1	"	"	68·7
77·052	77·11 76·17	77·2 76·3 75·7	0 2 ln	"	"	92·7 38806·0
75·339		74·8 74·3	1 1	"	"	18·5
73·654	73·65	73·6 73·3	0 1	"	"	35·7 44·0
	73·09 72·71	73·0 72·7	1 ln	"	"	52·5 58·2
72·512			2	"	"	61·2
72·370			2	"	"	63·3
71·068	71·17	71·3 70·8 70·5	2 2 1	"	"	81·4 83·0
70·180		70·0	0	"	"	96·4
69·840	69·84	69·8 69·5	2 1	"	"	38901·6
	68·93	69·1	2	"	"	15·4
68·854		68·2	4 1	"	"	16·6
67·981		67·7	1	"	11·4	29·7
66·666	66·67 66·30	66·8 66·5 66·1	2 2 1	"	"	49·6 55·2
	65·77	65·8 65·5 Pd	2 1	"	"	63·3
65·277		65·1	1	"	"	70·7
64·674	64·73	64·9	1	0·74	"	79·9
64·503			0	"	"	82·5
	64·02	64·2	2	"	"	89·9
	63·78	63·8	1	"	"	93·5
	63·38	63·5	1	"	"	99·6
	63·00	63·2	1	"	"	39005·4
62·252	62·58	62·8 62·4 61·7 61·4 61·1	1 2 1 1 1	"	11·5	11·7 16·7
60·920		61·0	3	"	"	37·0
60·347	60·35	60·5 60·1	2 1	"	"	45·7

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2559.497	2559.60	2559.7	0	0.74	11.5	39058.7
	58.91			"	"	
58.626	58.63	58.7	2	"	"	72.0
58.359			0	"	"	76.1
	58.13	58.2	1	"	"	79.6
57.784	57.78	57.9	1	"	"	84.8
	57.25	57.3	2	"	"	93.0
56.994	56.96	56.9	0	"	"	96.9
56.100	56.10	56.2	2	"	"	39110.6
55.955	55.96	55.9	2	"	"	12.8
55.734			0	"	"	16.2
		55.0	1n	"	"	
54.790			1	"	"	30.7
		54.5	1	"	"	
54.060			1	"	"	41.9
	53.58	53.6	1n	"	"	46.0
52.965			0	"	"	63.5
52.524			0	"	"	65.4
52.384			0	"	"	68.5
52.083	52.08	52.10	0	"	"	72.3
51.822	51.82	51.7 Pd	0	"	"	76.2
51.466		51.4	1	"	"	81.6
50.946			1	"	"	89.6
	49.92	50.0	2	"	"	39205.4
49.664			2	"	"	09.4
49.576		49.6	2	"	"	10.7
49.260	49.26	49.3	0	"	"	15.6
	48.86	49.0	1	"	"	21.7
		48.1	1	"	"	
47.600	47.80	47.8	1	"	"	41.2
		47.0	2	"	"	
46.765	46.81		2	"	"	54.0
45.866	46.01	45.8	0	"	"	67.8
	45.10	45.1	1n	"	"	79.6
44.318	44.32	44.4	2	"	"	91.6
43.778			1	"	"	39300.1
43.349	43.35	43.38	2	"	"	06.7
43.240			0	"	"	08.4
42.601			0	"	"	18.3
	42.24	42.3	2n	"	"	23.8
		41.6	1	"	"	
41.381			0	"	"	37.1
40.411	40.41	40.43	0	"	"	52.2
39.822	39.82	39.90	1	"	"	61.3
38.565			0	"	"	80.9
		38.1	1n	"	"	
37.776	37.78	37.6	0	"	"	93.1
	37.18			"	"	
	36.90			"	"	
	36.51			"	"	
36.315			0	"	"	39415.7
	35.80	35.7	2	"	"	23.8
	35.42	35.5	2	"	"	29.7
35.147	35.15	35.1	0	"	"	33.9
	34.23	34.2	2	"	"	48.2
	33.66	33.6	1	"	"	57.1

RUTHENIUM—*continued*.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2533·331	2533·33	2533·3	1	0·74	11·5	39462·2
32·128			1	"	"	68·7
	30·67	30·6	2	"	"	39503·7
	30·40	30·2	1	"	"	07·9
29·812	29·81	29·7	1	"	11·6	17·0
28·813			0	"	"	32·8
28·027	28·03	28·00	0	"	"	45·0
	27·19	27·2	1 <sub>n</sub>	"	"	58·1
26·914		27·1	2	"	"	62·4
26·011			0	"	"	76·7
25·726	25·68	25·6 Ir	0	"	"	81·0
25·263			0	"	"	88·3
	25·12			"	"	
24·952	24·95	25·0	0	"	"	99·9
		24·6	1	"	"	
		23·9	1	"	"	
		23·3	1	"	"	
	22·83	22·8	1	"	"	39626·4
22·410		22·5	0	"	"	33·0
21·700		21·9	2	"	"	44·2
	21·08	21·0	2	"	"	53·9
20·925	20·89	20·8	1	"	"	56·4
20·041			0	"	"	70·3
	19·49	19·32	4	"	"	78·9
18·601	18·60	18·55	0	"	"	94·6
17·728			2	"	"	39706·7
17·403	17·40	17·38	2	"	"	11·9
	17·00			"	"	
16·882		16·9	0	"	"	20·1
	16·25	16·2	1 <sub>n</sub>	"	"	30·0
	15·74	15·8	1	"	"	38·1
15·372		15·5	1	"	"	43·9
	14·10	14·3	1 <sub>n</sub>	"	"	64·1
13·417	13·42	13·40	2	"	"	74·9
12·898		13·0	2	"	"	83·1
	12·79	12·7	1	"	"	84·8
11·652		11·7	1	"	11·7	39802·7
	11·41	11·4	1 <sub>n</sub>	"	"	04·9
11·058			0	"	"	12·1
10·238			0	"	"	25·2
09·709		09·6	0	"	"	33·6
09·160		09·2	1	0·73	"	42·3
08·508	08·81	08·80	2	"	"	52·6
08·377		08·4	2	"	"	54·8
07·090	07·13	07·16	2	"	"	75·1
	06·61	06·6	2	"	"	82·7
		06·5	2	"	"	
	06·18	06·1	1	"	"	91·2
	05·73	05·8 Pd	1	"	"	96·8
		05·5	1	"	"	
	05·13	05·1	1	"	"	39906·3
	03·40	03·4	1	"	"	34·0
02·966		03·0	0	"	"	40·9
02·484	02·48	02·5	0	"	"	48·5
01·990	02·12	02·1	0	"	"	56·5
01·569		01·7	2	"	"	61·2



RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2500-940			0	0.73	11.7	39973.3
00.484	2500.36	2500.3	0	"	"	80.5
2499.873		2499.9	2	"	"	90.3
	2499.60	99.5	1	"	"	94.7
		99.2	1	"	"	
98.670	98.67	98.7 Pd	2	"	"	40009.6
98.512		98.6	2	"	"	12.1
		98.1	1	"	"	
	97.14	97.0	1	"	"	34.1
95.775	95.88	95.8	2	"	"	56.0
94.773	94.77	94.6	1	"	"	73.6
	94.22	94.3	1	"	"	81.0
94.116	94.00	93.80	2	"	11.8	82.7
		92.9	1	"	"	
		92.3	1	"	"	
		92.1	1	"	"	
91.847	91.85	91.6	2	"	"	40119.1
		91.4	1	"	"	
	91.10	91.2	2	"	"	31.1
90.555		90.7	0	"	"	39.9
90.017			2	"	"	48.6
	89.34	89.5	2	"	"	59.5
	88.58	88.7 Pd	2	"	"	71.8
		88.3	1	"	"	
		88.1	1	"	"	
		87.7	1	"	"	
	87.26	87.3	1	"	"	93.1
		86.7 Pd	ln	"	"	
	86.31	86.3	1	"	"	40208.5
	84.66			"	"	
84.055	84.06	84.2	0	"	"	45.0
	83.82	83.7	1	"	"	47.8
		83.3	1	"	"	
		83.0	2	"	"	
82.628			0	"	"	68.1
		82.0	1	"	"	81.0
	81.83			"	"	
81.216	81.22	81.30	0	"	"	91.0
	80.83	81.0	2	"	"	97.3
		80.3	1	"	"	
79.611			0	"	"	40317.1
79.458			0	"	"	19.6
79.010	79.01	79.02	2	"	"	26.9
	78.33	78.5	2	"	"	38.0
		78.2	1	"	"	
	77.22	77.4	2	"	"	56.1
		77.1	1	"	"	
76.960		76.6	2	"	11.9	60.3
76.395		76.4	0	"	"	69.2
75.483			2	"	"	84.4
		75.0	2	"	"	
74.506	74.55		0	"	"	40400.2
74.115		74.2	1	"	"	06.6
	73.55	73.8	1	"	"	15.8
	72.81	73.0	2	"	"	27.9
72.215	72.22	72.6	0	"	"	37.6

## RUTHENIUM—continued.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2471.576		2471.8	0	0.73	11.9	40448.1
		71.3	1	"	"	
70.805			0	"	"	60.7
70.608	2470.61	70.7	0	"	"	64.0
	69.78			0.72	"	
		68.8	1	"	"	
		68.5	1	"	"	
67.674	67.67	67.7	0	"	"	40512.1
		67.5	1	"	"	
		67.3	1	"	"	
		66.4	1n	"	"	
		65.7	1	"	"	
		65.5	1	"	"	
		65.1	1	"	"	
64.781	64.78	64.9	2	"	"	59.7
64.474			0	"	"	64.7
		64.0	1	"	"	
63.026	63.03	63.1	2	"	"	88.6
		62.8	1	"	"	
	62.20	62.3	1	"	"	40603.2
61.506		61.7	0	"	"	13.7
		61.5	1	"	"	
	60.57			"	"	
	60.17	60.1	1	"	"	35.7
		59.6	1	"	"	
		59.4	1	"	"	
59.146	59.15		0	"	12.0	42.6
58.706		58.8 Rh	2	"	"	59.8
57.311	57.31	57.4	0	"	"	82.9
57.050			1	"	"	87.2
56.666		56.70	4	"	"	93.6
56.519	56.59	56.60	4	"	"	96.0
56.376			0	"	"	98.3
55.614	55.61	55.66	5	"	"	40712.0
55.005		54.9	2	"	"	21.2
54.267	54.27	54.4	0	"	"	33.6
	53.85	54.0	2	"	"	40.3
		52.6	1n	"	"	
	51.27	51.4	2	"	"	83.2
		51.1	2	"	"	
50.650	50.90	50.7	1	"	"	93.5
50.464	50.46	50.6	0	"	"	96.7
49.958			1	"	"	40805.0
		49.6		"	"	
48.958	48.96	49.0	0	"	"	28.0
		48.4	1	"	"	
47.537		47.6	1n	"	"	45.4
		46.9	1	"	"	
		46.7	1	"	"	
45.519	45.52		0	"	"	79.1
44.924			0	"	"	89.1
44.497		44.5	0	"	"	96.2
44.129		44.2	1	"	"	40902.4
	43.48	43.4	2n	"	12.1	13.2
43.036			0	"	"	21.6
	41.82	41.6	1	"	"	41.0

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
2441.419	2441.42	2441.4	0	0.72	12.1	40947.7
41.051	41.05	40.9	1	"	"	53.9
39.715	39.72	39.7	0	"	"	76.3
		39.3	1	"	"	
		39.0	1	"	"	
		38.8	1	"	"	
		38.5	1	"	"	
		37.3	1	"	"	
37.019		37.1	0	"	"	41021.7
		36.6	1	"	"	
		36.3	1	"	"	
	35.53	35.62	4	"	"	46.8
34.980	34.98	35.1	0	"	"	65.9
	33.81	34.0	1n	"	"	75.7
		33.2	1n	"	"	
		33.0	1	"	"	
	32.25	32.3	2	"	"	41102.1
		31.6	1	"	"	
		30.8	1	"	"	
	30.45	30.5	2	"	"	32.6
29.672		29.6	2	"	"	45.7
		29.4	1	"	"	
		29.1	1	"	"	
	28.98	29.0	1	"	"	57.5
	27.82	27.8	2	"	12.2	77.0
	27.26	27.2	1	"	"	86.5
	26.96			"	"	91.6
	26.66	26.7	1	"	"	96.7
		26.0	1n	"	"	
		25.7	1n	"	"	
	24.56	24.6	1	"	"	41232.5
		23.7	1n	"	"	
	22.91	23.0	2	"	"	60.5
	22.30	22.4	2	"	"	70.9
		21.4	1	0.71	"	
20.905		20.9	2	"	"	94.7
	20.24	20.3	1	"	"	41306.0
		20.2	1	"	"	
		20.0	1	"	"	
	19.04	19.1	1	"	"	27.5
		18.6	1	"	"	
		18.3	1	"	"	
	17.05	17.1	2	"	"	60.6
	16.64			"	"	
	15.82	15.8	2	"	"	81.6
	15.30	15.4	2	"	"	90.5
	14.93	14.9	2	"	"	96.9
	14.00	14.0	2	"	"	41412.8
	13.60	13.5	2	"	"	19.6
	13.32			"	"	
		12.9	1	"	"	
		12.6	1	"	"	
		12.1	1	"	"	
	11.62	11.7	1	"	12.3	53.6
		11.5	1	"	"	
		11.2	1	"	"	

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo	
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$		
2408·744	2410·24	2410·8	1	0·71	12·3	41477·3	
		10·3	2	”	”		
		10·0	1	”	”		
		09·7	1	”	”		
		08·7	1	”	”		
07·997	08·51			”	”	16·0	
	08·00		2	”	”		
	07·37	07·6	1	”	”		
		07·1	1	”	”		
	06·67	06·9	1	”	”		
02·802	06·12			”	”	38·9	
		05·5	1	”	”		
		05·4	1	”	”		
	05·00	05·1	1	”	”		67·7
		04·9	1	”	”		
		04·6	1	”	”		
	02·80	02·90	4	”	”	41605·8	
	01·93			”	”	33·8	
	01·18	01·3	1	”	”		
		00·7	1n	”	”		
	00·38	00·3	1	”	”	47·8	
	2399·28			”	”	99·7	
	98·63			”	”		
		2398·0	2	”	”		
	97·70	97·2	2	”	12·4		
96·79	96·90	2	”	”			
	96·0	1n	”	”			
95·66	95·6	1	”	”			
	95·3	1	”	”			
	95·0	1	”	”			
94·70			”	”			
92·501		94·2	2	”	”	61·5	
	93·84	93·7	1	”	”		
		93·3	1	”	”		
		92·7	2	”	”		
	92·1	92·1	2	”	”		84·9
		91·8	1	”	”		
		91·73	91·4	1	”	”	
		90·6	1	”	”	98·3	
		90·4	1	”	”		
		90·1	1	”	”		
		88·5	1	”	”		
		88·3	1n	”	”		
	87·28			”	”	41942·2	
		84·3	1	”	”		
	83·53	83·7	2	”	”		
83·0		1	”	”			
82·08		82·18	4	”	12·5		
	81·5	1	”	”	67·6		
	81·2	1	”	”			
	81·0	1	”	”			
	80·8	1	”	”			
	80·1	2	”	”			
79·94	79·9	2	”	”	42002·4		
79·54			”	”			
	77·6	1n	”	”			



RUTHENIUM—*continued*.

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda}$	
2375·346	2376·30	2376·6	2	0·71	12·5	42069·7
	75·71	75·80	4	"	"	80·2
		75·6	1	"	"	
		75·3	2	"	"	86·6
		75·1	1	"	"	
70·251		74·3	1	"	"	
	72·08	72·2	2	0·70	"	42144·6
	70·25	70·4	2	"	"	77·1
		70·2	1	"	"	
		68·7	1n	"	"	
67·31		68·2 Ir	1	"	"	
		67·5	2	"	12·6	42229·4
		64·6	1	"	"	
	64·13	64·3	1n	"	"	86·3
		63·7	1n	"	"	
62·47		62·9	1	"	"	
		62·7	1	"	"	42316·0
		62·3	1	"	"	
		60·8	1n	"	"	
	59·14	59·3	2	"	"	71·7
57·991	58·90	58·95	4	"	"	80·0
	57·99	58·10	2	"	"	96·2
	52·92	53·2	2	"	12·7	42487·7
51·411		51·6	2	"	"	42515·0
	51·23	51·3	1	"	"	18·2
	50·51	50·7	1	"	"	31·3
	46·45	46·6	1	"	"	42604·9
		44·7	1	"	"	
42·920		43·6	1	"	"	
	42·92	43·03	2	"	"	69·1
	42·66	42·7	2	"	"	75·6
40·767	41·11			"	"	
	40·77	40·8	2	"	12·8	42708·2
	40·00	40·2	1	"	"	22·2
		39·4	1	"	"	
		38·9	1	"	"	
38·094	38·05	38·1	2	"	"	57·1
	36·93	37·0	2	"	"	78·4
		36·1	1	"	"	
35·047	35·05		2	"	"	42812·9
		34·5	1	"	"	
	34·05	34·1	2	"	"	31·2
	33·72	33·8	2	"	"	37·2
	32·26	32·5	1n	"	"	64·0
	31·81	31·9	1	"	"	72·3
	31·23	31·3	2	"	"	83·0
	29·11	29·2	2	"	"	42922·0
		28·5	1	"	"	
		28·1	1	"	"	
	20·82			0·69	"	
13·51		20·0	2	"	"	
		18·7	1	"	"	
		13·6	1	"	13·0	43210·4
		09·3	1	"	"	
		08·8	1	"	"	
		08·6	1	"	"	

RUTHENIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Spark Spectrum		Intensity and Character	Reduction to Vacuum		Oscillation Frequency in Vacuo
	Adeney	Exner and Haschek		$\lambda +$	$\frac{1}{\lambda} -$	
	2305·85	2308·1	ln	0·69	13·0	
	04·97	05·7	2	"	"	43356·0
	03·06			"	"	
	2298·80	2298·7	1	"	13·1	87·9
	97·28	97·5	1	"	"	43416·6
		94·6	1	"	"	
		94·2	1	"	"	
	87·2	87·2	2	"	13·2	43708·4
		83·2	1	"	"	
	82 00	81·8	2	"	"	43808·0
		81·7	1	"	"	
		79·7	1	"	"	
		79·4	ln	"	"	
		78·7	ln	"	"	
		72·3	ln	0·68	"	
	68·26	68·3	1	"	13·3	44073·4
	63·73	63·6	1	"	"	44161·6
		61·1	1	"	"	
		51·7	1	"	"	

## YTTRIUM.

Lohse, 'Sitzber. kaiserl. Akad. Wissensch. Berlin,' xii. 1897.

Exner and Haschek, 'Sitzber. kaiserl. Akad. Wissensch. Wien,' cviii. 1899.

Kayser, 'Abhandl. königl. Akad. Wissensch. Berlin,' 1903.

Wave-length (Kayser) Arc Spectrum	Intensity and Character	Spark Spectrum. Exner and Haschek	Lohse Arc Spark	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
6701·188	2			1·82	4·0	14918·7
6687·892	2			"	"	50·6
56·056	1			1·81	4·1	15019·8
50·880	1			"	"	33·9
13·988	1			1·80	"	15115·4
6585·077	1			1·79	"	81·7
77·096	1			"	"	15200·2
64·059	1			1·78	"	30·4
57·568	2			"	"	45·4
38·797	3			"	"	89·2
05·611	1			1·77	4·2	15367·1
6437·414	1			1·75	"	15530·0
35·226	5			"	"	35·3
02·229	3			1·74	"	15615·4
6396·588	1			"	"	29·1
6275·214	1			1·71	4·3	15931·4
36·962	b			1·70	"	16029·2
22·787	4			1·69	4·4	65·6
18·150	b			"	"	77·5
00·043	b			"	"	16124·7
6191·930	1			1·68	"	45·7

YTTRIUM—*continued.*

Wave-length (Kayser) Arc Spectrum	Intensity and Character	Spark Spectrum. Exner and Haschek	Lohse Arc Spark	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
6182.455	b			1.68	4.4	16170.4
65.310	b			"	"	16215.4
50.935	1			1.67	"	53.3
48.624	b			"	"	59.4
38.645	4			"	"	85.9
37.893	1			"	"	87.8
34.240	3			"	"	97.5
32.343	b			"	"	16312.6
27.610	1			"	"	15.2
24.701	1			"	"	22.9
14.954	1			"	"	49.0
08.050	1			1.66	"	67.4
02.967	1			"	"	81.1
6096.999	1			"	"	97.1
89.597	1			"	"	16417.0
88.190	2			"	4.5	20.7
82.800	1			"	"	35.3
81.448	1			"	"	39.0
73.034	1			1.65	"	59.3
60.526	1			"	"	95.7
53.998	b			"	"	16513.5
42.778	1			1.64	"	44.2
40.463	2			"	"	40.5
36.833	b			"	"	60.5
25.513	1			"	"	91.6
23.624	2			"	"	96.8
20.105	b			"	"	16606.5
08.424	2			"	"	37.8
07.929	1			"	"	40.2
04.906	1			1.63	"	48.6
03.810	b			"	"	51.6
5987.870	b			"	"	93.1
82.133	2			"	"	16711.9
72.324	b			"	"	39.4
66.439	1			1.62	"	55.9
50.249	2			"	4.6	16801.4
45.946	3			"	"	13.6
45.081	1			"	"	16.0
03.201	2			1.61	"	16935.3
5880.218	1			1.60	"	17001.5
72.072	1			"	4.7	25.2
32.480	1			1.59	"	17138.7
22.064	2			"	"	75.4
12.888	1			1.58	"	98.6
5797.348	1			"	"	17244.6
87.907	1			"	"	72.7
81.901	2			"	"	90.6
74.143	2			1.57	"	17313.9
65.849	3			"	"	42.9
44.046	3			"	"	17404.5
43.567	1			"	"	06.1
40.417	1			1.56	"	15.6
29.087	3			"	"	50.1
27.090	1			"	"	56.2
23.663	2			"	"	66.6
20.801	3			"	4.8	75.3

## YTTRIUM—continued.

Wave-length (Kayser) Arc Spectrum	Intensity and Character	Spark Spectrum. Exner and Haschek	Lohse Arc Spark	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
5706·926	5			1·56	4·8	17517·9
5675·480	3			1·55	"	17614·8
75·311	2			"	"	15·3
69·456	1			"	"	33·6
68·784	1			"	"	35·7
* 63·148	6			1·54	"	53·2
61·107	1			"	"	59·6
57·479	1			"	"	70·9
48·684	5			"	"	98·4
46·909	2			"	"	17704·1
44·898	4			"	"	10·3
35·966	1			"	"	38·4
33·121	2			"	"	47·3
32·477	2			"	"	49·4
30·353	5			"	"	56·1
24·114	2			"	"	75·8
10·580	1			1·53	"	17818·7
06·552	3			"	4·9	31·4
5598·537	1			"	"	56·9
91·168	2			"	"	80·4
82·098	5			1·52	"	17909·5
81·295	2			"	"	12·1
77·621	4			"	"	23·9
67·972	3			"	"	55·0
56·655	4			"	"	91·5
51·209	2			1·51	"	18009·3
46·228	4			"	"	25·4
* 44·818	5			"	"	30·0
41·852	3			"	"	39·6
27·765	6			"	"	85·6
25·944	2			"	"	88·3
21·845	6r			"	"	18105·0
13·856	2			1·50	"	31·2
* 10·115	5			"	"	43·5
03·665	5			"	5·0	64·7
5497·637	5			"	"	84·6
95·802	2			"	"	90·7
93·375	3			"	"	98·7
91·634	2			"	"	18204·5
80·952	3			"	"	40·0
73·596	4			1·49	"	64·5
66·669	6			"	"	87·7
38·447	4			1·48	"	18382·6
24·588	3			"	"	18429·5
17·246	2			"	"	54·6
* 03·003	4			"	"	18503·2
5388·623	1			1·47	5·1	52·5
80·851	3			"	"	83·9
5290·004	2			1·45	5·2	18898·4
70·527	3			1·44	"	18968·2
69·712	5			"	"	71·2
40·958	2			1·43	"	19075·3
* 05·890	6			1·42	5·3	19203·7
00·580	5			"	"	23·3

\* Rowland : 5663·155, 5544·831, 5510·120, 5402·982, 5205·897.



## YTTRIUM—continued.

Wave-length (Kayser) Arc Spectrum	Intensity and Character	Spark Spectrum. Exner and Haschek	Lohse Arc Spark	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
5196.588	2			1.42	5.3	19238.1
35.356	3			1.40	"	19467.5
* 23.380	4			"	"	19513.1
19.283	3			"	"	28.7
03.941	1			"	5.4	87.3
*5087.600	5			1.39	"	19650.2
73.344	2			"	"	19705.5
70.363	2			"	"	17.0
07.134	3			1.37	5.5	19966.0
4982.297	3			1.36	"	20065.6
74.466	3			"	"	97.2
48.740	1			1.35	"	20201.7
31.129	2			"	5.6	73.7
28.427	1			"	"	84.9
26.503	1			"	"	92.8
22.063	3			"	"	20311.1
12.236	1			1.34	"	51.7
09.185	2			"	"	64.4
06.275	2			"	"	76.5
* 00.304	6			"	"	20401.3
4895.436	1			"	"	21.6
93.620	2			"	"	29.2
86.832	2			"	"	57.5
86.464	2			"	"	59.1
* 83.881	6			"	"	69.9
81.629	1			"	"	79.4
79.832	2			"	"	86.9
79.339	1			"	"	88.9
63.303	1			1.33	5.7	20556.5
60.031	3			"	"	70.3
56.896	2			"	"	83.6
55.073	6			"	"	91.3
54.437	2			"	"	94.0
52.860	4			"	"	20606.0
45.862	4			"	"	35.7
40.052	5			1.32	"	55.2
39.335	2			"	"	58.3
26.438	1			"	"	20713.5
23.497	4			"	"	26.1
23.310	3			"	"	26.9
21.813	2			"	"	33.4
19.857	4			"	"	41.8
18.396	b			"	"	48.1
17.589	b			"	"	51.6
04.986	3			1.31	"	20806.0
04.502	2			"	"	08.1
4799.491	4			"	"	29.8
87.078	3			"	"	83.8
86.753	4			"	"	85.3
81.217	4			"	5.8	20909.3
80.360	2			"	"	13.1
66.280	1			1.30	"	74.9
63.142	1			"	"	88.8
61.169	5			"	"	97.4

\* Rowland : 5123.390, 5087.610, 4900.301, 4883.867.

## YTTRIUM—continued.

Wave-length (Kayser) Arc Spectrum	Intensity and Character	Spark Spectrum. Exner and Haschek	Lohse Arc Spark	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
4752.970	4			1.30	5.8	21033.7
41.595	3			"	"	84.2
33.637	1			"	"	21119.6
32.565	3			"	"	23.9
28.710	4			1.29	"	41.6
26.031	2			"	"	53.6
04.818	1			"	5.9	21248.9
01.165	2			"	"	65.4
4699.424	2			"	"	73.4
96.976	3			"	"	84.4
92.137	2			1.28	"	21306.3
89.938	3			"	"	16.3
82.501	6			"	"	50.2
78.523	2			"	"	68.4
75.030	6			"	"	84.3
71.020	2			"	"	21402.7
67.024	2			"	"	21.0
66.567	2			"	"	23.1
59.058	3			"	"	57.6
58.497	4			"	"	60.2
53.951	2			1.27	"	81.2
52.309	2			"	"	88.8
43.863	6			"	"	21527.9
27.390	1			"	6.0	21604.4
13.165	2			1.26	"	71.1
04.977	3			"	"	21710.6
01.484	2			"	"	26.1
4596.771	4			"	"	48.4
90.972	2			"	"	76.2
85.505	1			"	"	21801.8
82.352	2			"	"	16.8
81.954	2			"	"	18.7
81.506	2			"	"	20.9
79.043	2n			1.25	"	33.6
73.746	4			"	"	57.9
70.855	2			"	"	71.7
65.120	2			"	"	99.2
64.576	2			"	6.1	21901.7
59.558	4			"	"	25.8
55.491	3			"	"	45.4
54.651	2			"	"	49.5
44.500	3			"	"	98.5
42.222	2			1.24	"	22009.5
34.298	2			"	"	48.0
27.983	4	4527.98		"	"	78.8
27.430	5	27.43		"	"	81.5
22.242	2	22.16		"	"	22106.8
14.190	3			"	"	46.2
13.764	3			"	"	48.3
06.139	6	06.12		"	"	85.7
03.534	1			1.23	"	98.6
4492.592	2			"	6.2	22252.6
91.924	3			"	"	56.0
87.683	4	87.61		"	"	77.0
87.433	3			"	"	78.2
84.621	2			"	"	92.2

## YTTRIUM—continued.

Wave-length (Kayser) Arc Spectrum	Intensity and Character	Spark Spectrum. Exner and Haschek	Lohse Arc Spark	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
4479.184	2			1.23	6.2	22319.3
77.628	4	4577.59		"	"	27.0
77.140	4	77.10		"	"	29.3
75.900	4	75.9		"	"	35.7
74.074	3			"	"	44.8
72.953	2			"	"	50.4
65.463	2	65.50		1.22	"	87.9
46.805	4			"	"	22481.8
45.491	3			"	"	88.7
43.834	4	43.83		"	"	96.9
37.519	3			"	"	22528.9
36.321	2	36.37		"	"	35.0
33.145	1			"	"	51.1
27.191	1			1.21	6.3	81.3
22.772	6	22.80		"	"	22604.0
18.360	1			"	"	26.5
17.635	2			"	"	30.3
15.552	2			"	"	40.9
02.574	1			"	"	22707.7
4398.201	5	4398.21		"	"	30.2
97.904	2			"	"	31.8
94.840	3			"	"	47.7
94.184	2			"	"	51.0
93.788	1			1.20	"	53.1
87.908	3	87.84		"	"	83.6
85.649	2			"	"	95.3
79.499	4			"	"	22827.4
75.794	3			"	"	46.7
75.113	8	75.11		"	"	50.2
71.621	1			"	"	68.5
71.144	2			"	"	71.0
66.204	3	66.30		"	6.4	96.8
58.895	5	58.91		"	"	22935.2
57.876	4			"	"	40.6
53.833	1			1.19	"	61.9
52.499	2			"	"	68.9
48.957	7	48.91		"	"	87.6
46.323	2			"	"	23001.6
44.812	3			"	"	09.6
37.476	2			"	"	48.5
30.945	3	30.85		"	"	83.3
24.765	1			"	"	23116.2
22.474	2	22.4		"	"	28.5
18.182	1			1.18	"	51.5
18.052	1			"	"	52.2
16.472	2			"	"	60.7
15.662	3			"	"	65.0
14.080	2			"	"	73.5
09.784	6	09.81		"	"	96.6
07.234	2			"	6.5	23210.2
05.499	1			"	"	19.6
02.431	5	02.45		"	"	36.2
00.526	3			"	"	46.5
4291.217	3			1.17	"	96.9

\* Rowland : 4358.879.

## YTTRIUM—continued.

Wave-length (Kayser) Arc Spectrum	Intensity and Character	Spark Spectrum. Exner and Haschek	Lohse Arc Spark	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
4275.650	1			1.17	6.5	23381.7
74.346	2			"	"	88.9
72.295	2			"	"	23400.1
69.001	1			"	"	18.2
67.085	3			"	"	28.6
51.343	5	4251.39		"	6.6	23515.3
50.532	1			1.16	"	19.9
41.924	1			"	"	67.6
35.852	3	35.94		"	"	23601.4
32.709	2			"	"	18.9
31.461	1			"	"	25.9
29.351	1			"	"	37.7
24.396	3			"	"	65.4
20.779	4	20.81		"	"	85.7
17.960	3			"	"	23701.5
13.698	3			"	"	25.5
13.174	2			"	"	27.9
09.872	1			"	"	47.1
04.847	4	04.84		"	"	75.5
4199.442	3	4199.46		1.15	6.7	23806.0
77.684	5	77.65		"	"	23930.0
74.287	4	74.31		"	"	49.6
* 67.670	3	67.81		1.14	"	87.6
57.786	2			"	"	24044.7
43.017	6r	43.03		"	6.8	24130.2
28.472	6r	28.49		"	"	24215.2
25.079	4	25.10		1.13	"	35.2
10.964	3			"	"	24320.3
06.552	2			"	"	44.5
* 02.548	7r	02.60		"	"	68.3
4095.617	1			"	6.9	24409.4
* 83.862	5	83.89		"	"	79.7
81.391	3			1.12	"	94.0
81.089	2			"	"	96.4
* 77.522	6r	77.54		"	"	24517.8
65.159	1	65.20		"	"	92.4
48.004	2	47.98		"	7.0	24696.5
* 47.774	4	47.81		1.11	"	97.9
44.407	2			"	"	24718.4
44.235	1			"	"	19.1
* 39.981	4	4040.0		"	"	45.6
30.011	3			"	"	24806.8
3987.652	3	3987.4		"	7.1	25070.3
* 82.746	6	82.75		1.10	"	25101.2
78.775	1	78.74		"	"	26.3
73.597	2			"	"	59.0
67.847	1			1.09	"	95.5
55.237	3			"	7.2	25275.7
54.431	1			"	"	80.9
* 51.739	3	51.76		"	"	98.1
50.499	5	50.51		"	"	25306.1
46.350	2			"	"	32.6
30.799	4	30.84		"	"	25432.9

\* Rowland: 4167.737, 4102.541, 4083.783, 4077.498, 4047.823, 4040.013, 3982.742, 3951.765, 3950.497.



## YTTRIUM—continued.

Wave-length (Kayser) Arc Spectrum	Intensity and Character	Spark Spectrum. Exner and Haschek	Lohse Arc Spark	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
3904.738	3	3904.72		1.08	7.3	25602.6
00.425	2			"	"	31.0
3892.570	2			"	"	82.7
90.281	1			1.07	"	97.3
87.928	3			"	"	25713.3
78.418	2	3878.47		"	"	76.4
52.541	1			"	"	25949.6
46.805	1			1.06	"	88.3
40.575	2			"	"	26030.5
33.006	2	33.00		"	"	81.9
26.064	2	26.00		"	"	26129.2
18.513	3	18.49		"	"	80.9
*3788.839	5	3788.88		"	7.4	26384.9
* 74.494	5	74.51		1.05	"	26486.2
70.740	1			1.04	7.5	26512.5
47.695	3	47.70		"	"	26675.5
38.772	2			"	"	26739.2
35.756	1			1.03	"	60.8
34.422	1			"	"	70.4
24.920	3			"	7.6	26838.7
18.237	3			"	"	86.8
* 10.448	6r	10.41		"	"	26941.3
3697.923	2	3697.88		"	"	27034.6
96.721	2			"	"	43.4
93.989	1			"	"	63.4
92.667	4			"	"	73.1
82.985	1	82.85		"	7.7	27144.2
82.748	1			"	"	45.9
68.640	3	68.67		"	"	27250.3
* 64.744	8	64.76		"	"	79.3
61.086	2			"	"	27306.5
56.390	2	56.30		"	"	41.6
54.796	2	54.77		"	"	54.6
53.636	2			"	"	62.3
52.801	1			"	"	68.5
46.363	2	46.35 Sa		"	"	27416.9
45.567	3	45.54		"	"	22.9
39.422	3			"	"	69.2
35.471	2			"	7.8	98.9
* 33.267	4	33.28		"	"	27515.6
* 28.852	7	28.89		"	"	49.1
* 21.099	5	21.12		"	"	27608.2
* 11.194	6	11.19		"	"	83.9
* 02.069	6	02.12		"	"	27754.0
* 00.884	7	00.90		"	"	63.1
*3593.071	5	3593.11		"	7.9	27823.4
* 84.656	2	84.71		"	"	88.9
76.209	3			"	"	27954.7
71.587	2			"	"	90.8
52.843	4			"	"	28138.6
* 49.153	7	49.21		"	8.0	68.7
13.036	3			"	"	28457.4
11.354	3			"	"	71.0
3499.044	3n			"	8.1	28571.1

\* Rowland : 3788.839, 3774.473.

## YTTRIUM—continued.

Wave-length (Kayser) Arc Spectrum	Intensity and Character	Spark Spectrum. Exner and Haschek	Lohse Arc Spark	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
*3496.233	6	3496.25		1.03	8.1	28594.1
85.885	4			"	"	28679.0
84.208	2			"	"	92.7
68.028	3	68.05		"	8.2	28726.5
61.168	2	61.15		"	"	92.0
54.322	2n	54.23		"	"	28940.9
51.082	3			"	"	68.0
48.962	5	48.98		"	"	88.9
33.159	1			"	"	29119.5
12.620	2			"	8.3	94.7
09.914	1			"	"	29324.6
3397.169	3			"	"	29428.0
90.021	1			"	8.4	89.9
88.725	3			"	"	29501.2
83.206	2			"	"	49.3
82.975	2			"	"	51.4
80.054	1			"	"	87.0
77.863	2			"	"	96.2
64.923	2			0.94	"	29710.0
62.381	3	3362.20		"	"	32.5
62.131	4			"	"	34.7
59.082	2			"	8.5	61.6
54.979	1			"	"	99.6
54.749	1			"	"	29800.4
44.680	1n			"	"	89.7
40.528	2			"	"	29926.9
37.986	1			"	"	50.8
35.349	1			0.93	"	73.5
31.335	1			"	"	30009.5
31.029	2			"	"	12.3
* 28.013	6	28.11		"	"	39.5
19.922	1			"	8.6	30112.6
18.700	1			"	"	23.7
08.525	1			"	"	30216.3
3293.599	1n			0.92	"	30343.3
90.713	1			"	"	79.9
82.594	1	3282.7		"	8.7	30454.9
80.055	3			"	"	78.7
78.576	2			"	"	92.3
52.408	3			"	8.8	30742.6
* 42.408	7	42.49		0.91	"	30833.5
* 16.812	6	16.87		0.90	"	31077.9
06.652	1			"	8.9	31176.3
* 03.450	5	03.51		"	"	31207.4
* 00.386	5	00.44		"	"	37.3
*3195.741	7	3195.80		"	"	82.8
91.627	1			"	"	31323.1
91.438	4			"	"	24.9
79.539	5			0.89	9.0	31442.1
73.179	4	73.40		"	"	31505.2
55.785	1			"	"	31678.8
35.285	3	35.30		"	9.1	31885.8
30.059	3			0.88	"	31936.8
14.415	2	14.6		"	"	32099.6

\* Rowland : 3328.016, 3242.395, 3216.807, 3203.435, 3200.407, 3195.705.

## YTTRIUM—continued.

Wave-length (Kayser) Arc Spectrum	Intensity and Character	Spark Spectrum. Exner and Haschek	Lohse Arc Spark	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\lambda -$	
3112.151	3	3112.2		0.88	9.2	32122.9
11.924	3			"	"	25.3
09.007	2			"	"	55.4
04.808	1			"	"	98.1
03.846	2			"	"	32208.9
3096.741	1			"	"	82.8
95.998	3	3096.04		0.87	"	90.6
91.850	1			"	"	32333.9
86.981	2			"	"	84.9
76.634	2			"	9.3	32493.7
72.479	2			"	"	32537.7
59.639	1			0.86	"	32674.3
50.015	1			"	9.4	32777.3
47.252	2			"	"	32807.0
45.489	3			"	"	26.0
44.956	1			"	"	31.8
38.599	1			"	"	32900.4
36.710	1			"	"	16.0
22.404	3			"	9.5	33076.7
21.844	3			0.85	"	82.9
10.255	1			"	"	33210.3
2997.069	3			"	9.6	33359.4
95.383	2			"	"	75.1
84.376	4			"	"	98.4
74.710	3			"	"	33507.1
74.042	1			0.84	"	33614.6
65.096	4			"	9.7	33715.9
55.999	1			"	"	33819.8
48.533	4			"	"	33905.5
30.128	2			"	9.8	34118.4
19.167	3			0.83	9.9	34499.1
2890.497	1			"	"	34586.2
86.585	2			0.82	10.0	34633.0
84.583	1			"	"	57.1
56.419	1			"	10.1	34998.8
54.544	2			0.81	"	35021.8
26.450	1			"	10.2	35369.9
22.694	2			"	"	35417.0
18.982	1	2818.88		0.80	10.3	63.5
13.773	1			"	"	35529.2
00.319	1	00.30		"	10.4	35709.8
2791.319	1			"	"	35815.0
85.293	1	2785.32		"	"	92.5
60.174	3			"	10.5	36219.0
30.190	2			0.79	10.6	36616.8
23.096	3			0.78	10.7	36712.3
2672.190	1			"	10.9	37411.6
2547.661	1			0.77	11.5	39240.2
40.384	1			0.74	"	39352.6
2476.756	2			"	11.8	40363.6
63.826	2			0.73	11.9	40575.4
60.656	1	2460.73		0.72	"	40627.7
45.688	1			"	12.0	40876.3
45.309	2			"	"	82.7
24.246	2			"	12.2	41237.8
22.278	4	22.32		"	"	71.3

## YTTRIUM—continued.

Wave-length (Kayser) Arc Spectrum	Intensity and Character	Spark Spectrum. Exner and Haschek	Lohse Arc Spark	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\lambda -$	
2417·364	1			0·72	12·2	41355·2
2385·298	2			0·71	12·4	41911·1
61·883	1			"	12·6	42326·5
58·798	2			0·70	"	81·9
55·465	1			"	"	42441·9
54·266	2			"	"	83·5
32·651	2			"	12·8	42857·0
31·732	1			"	"	73·8
2289·087	2			"	13·1	43672·4
83·722	2			0·69	13·2	43775·0
83·370	1			"	"	81·7
77·738	1			"	"	43890·0
74·171	2			0·68	13·3	43958·7
72·884	1			"	"	83·7
71·853	1			"	"	44003·6
67·152	1			"	"	94·9
65·110	2			"	"	44134·7
64·452	2			"	"	47·5
62·768	1			"	"	80·3
60·661	1			"	13·4	44221·4
60·157	2			"	"	31·3
59·594	2			"	"	42·3
59·339	1			"	"	57·3
49·240	1			"	13·5	44445·9
45·720	1			"	"	44515·6
43·097	3			"	"	67·8
42·643	1			"	"	76·8
40·695	1			"	"	44615·6
36·384	1			"	13·6	44701·4
31·276	1			"	"	44803·7
28·241	1			"	"	64·8
27·849	1			0·67	"	72·7

## LINE SPECTRUM OF SULPHUR.

Eder and Valenta, 'Denkschr. kais. Akad. Wissensch. Wien,' lxvii. 1898.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
		5665·123	4	5559·129	1
		62·741	1n	56·141	4n
6400		60·289	6	36·968	3
6390		48·565	1	26·458	5n
25		47·296	8	20·749	3
10		45·920	2n	18·968	3n
6290		40·535	4	09·799	10
		40·257	8	5478·589	2n
		16·844	4	77·649	1
		06·349	8	75·209	2
		5579·327	6	73·791	8
5819·543	2	65·097	8	68·565	1
				54·000	10



LINE SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
5434·737	2	4661·782	1b <sup>v</sup>	4285·133	8
32·994	10	56·916	3	83·825	2
28·907	9	51·043	1	83·318	1
		50·440	1	82·741	3
		49·328	3	78·670	3
01·035	3n	48·416	1	69·942	4
5345·832	8	47·614	1n	67·959	4
20·894	8	42·024	2	67·255	6r
		39·024	1	59·408	2
5233·187	1	24·322	1n	57·603	3
30·040	1	13·618	1	53·772	10r
27·406	1	4596·368	1	50·150	1
27·072	1	91·285	1	36·230	1
20·872	1	91·164	2	31·182	4
19·650	3			27·590	2
12·803	8	62·118	2	21·810	2
07·482	2	52·592	5	17·397	4
01·520	2	49·723	3	4193·667	2
01·149	6	25·159	6	89·896	5b <sup>v</sup>
		24·817	2	86·120	1
		04·370	3	85·631	2
5160·348	2	4499·450	1	78·992	2
42·512	3	86·856	2	75·415	3
		85·907	2	74·471	7b <sup>v</sup>
		83·647	4	74·179	4
		81·661	1	68·554	4
03·535	4	78·633	1	65·255	1
5098·890	1	65·329	1	65·127	3b <sup>v</sup>
51·874	1	64·618	5	62·856	10
47·499	3	63·761	5b <sup>v</sup>	62·539	2
39·596	2	56·584	2	53·269	10b <sup>v</sup>
32·657	8	40·043	4	49·068	2
27·408	4	32·561	3	47·126	3
14·248	8	31·131	1b <sup>v</sup>	45·266	10
11·815	3	18·982	2	44·027	1
09·762	6	17·134	3	42·390	8b <sup>v</sup>
07·010	1	15·052	4	33·041	1
4993·733	3	4393·862	3	27·724	2
92·152	5	92·012	2	19·377	3
42·649	2	67·037	2	12·472	2
25·493	6	64·873	4	12·319	2
24·269	5	62·610	6	11·670	5
17·410	4n	61·671	5	05·151	1
02·656	2	60·625	1	4099·607	3
4885·831	3	54·739	5	99·360	2
24·353	2n	51·408	2	95·288	2
19·834	1	49·551	3	91·372	1
11·967	4	47·553	1	76·024	4
92·333	2	45·637	1	72·252	3
		40·444	4	70·077	3
		33·947	1	69·802	2
		32·852	5	64·634	3b
		30·798	1	50·328	2
		19·762	1	32·956	4b <sup>v</sup>
4716·382	4	18·847	3		
		17·299	2	28·995	6
4677·804	2	4294·558	8b <sup>v</sup>	11·469	1
63·738	2	91·606		09·566	1

LINE SPECTRUM OF SULPHUR—*continued.*

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4007.995	2	3861.541	1	3618.937	1
06.700	1	60.833	3b	17.086	4b
04.045	1	53.280	3		
3999.026	3	51.312	3b <sup>v</sup>	00.307	2n
98.998	4b <sup>v</sup>	47.319	2	3596.152	3
		45.336	1	94.575	3
98.127	3	42.502	2b	67.382	2n
93.706	5	39.368	2	60.857	1n
91.144	4b <sup>v</sup>	38.440	10	56.506	1n
		37.882	8	49.920	2b
86.158	5	31.980	4	43.856	3b
83.924	6	3794.841	5		
82.893	1b <sup>v</sup>	83.543	2b	40.416	3
		79.030	4	3499.566	1b
81.923	1	74.713	2		
80.002	4b <sup>v</sup>	60.030	2	97.438	8
		54.879	1	83.140	1
74.316	1	50.927	3	79.435	8b
73.341	4	49.554	4	74.061	6
70.820	3b	48.039	5	71.014	1n
70.640	3b	44.488	2	3390.354	3
63.279	3	27.457	3b	87.242	5
61.695	4	17.864	8b	85.986	2n
59.468	1	12.868	2b	77.300	1
59.189	2	10.604	2b	73.402	3n
54.457	2	09.470	6b	72.285	1n
50.866	1n	00.323	2b	70.490	4
47.326	2n	3699.529	3b	69.624	3
45.059	1	98.046	1	68.210	2
39.897	1n	96.373	3b	67.306	4
33.650	3b	89.639	1	63.294	1n
32.437	2	80.671	1	56.567	1n
32.104	3	78.329	4b	55.233	1
28.734	8	72.436	3	44.216	2n
23.788	3b <sup>v</sup>	69.139	6b	41.612	4
		63.513	1	40.508	3
20.997	2	62.107	5	30.924	1
19.550	3	56.715	3	25.013	5b
18.312	1	55.435	1	24.160	4
12.149	3	54.669	1	17.205	2
07.285	2	53.559	1n	14.643	1
3899.501	2	38.267	2	08.953	3
94.159	1	37.131	2	05.774	2
92.759	2b	36.305	1	01.806	1
82.366	3	32.144	8	01.211	2
76.353	2b	26.508	3		
64.773	1b	22.892	2		

## BAND SPECTRUM OF SULPHUR.

Eder and Valenta, 'Denkschr. kais. Akad. Wissensch. Wien,' lxvii. 1898.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
6380		5582.183	1	5556.189	2
20		81.192	1	55.654	3b
6265		80.882	1	55.209	1
6165		80.506	3	54.788	4
00		80.124	2	54.529	1
6036		79.536	1	54.197	3
5967		79.012	3	53.775	3b
00		78.871	3	53.251	2
5838		77.750	3	52.820	3
5779		77.424	3	52.514	1
12		76.891	2b	52.195	1
5653		76.356	1	51.836	3
01.812	3n	75.687	3	51.243	4
01.411	5	75.244	3	50.849	4
00.894	3	74.719	1	50.276	5
00.669	3	74.437	3	49.682	4b
5599.778	4	73.972	1		
99.477	4b	73.586	3	49.067	4
98.916	4	72.356	2	48.694	1
98.568	4	71.830	2	48.383	3
98.076	4	71.469	5	47.985	1
97.717	1	70.972	1	47.643	3
97.376	4	70.639	1	47.361	2
97.169	2	70.320	2	47.069	1
96.836	1	69.605	2	46.666	2
96.444	4b	69.112	4	46.409	2
95.898	4b	68.632	1	46.051	3
95.505	1	68.337	3	45.638	4
94.960	5b	68.030	3	45.178	4
		67.603	3	44.653	5
94.310	5b	67.235	2	44.220	4
93.864	5s	66.883	1	43.594	6
93.058	2b	66.622	2	43.177	2
92.649	1	66.369	2	42.747	5b
92.069	1	65.911	2	42.214	4
91.683	4	65.280	3	41.900	1
91.425	1	64.860	2	41.491	4
90.694	3	64.611	2	41.002	2
90.292	3b	63.976	5	40.712	5
89.798	4	63.132	1	40.235	3
88.813	2	62.717	1b	39.663	1
88.469	2	62.395	2	39.159	3
88.075	3b	61.886	3	38.621	6
87.408	1	61.441	4	38.189	3b
86.991	2	60.922	3b	37.836	3b
86.526	2b	60.407	2	37.309	5
86.168	2	59.787	3	36.926	4
85.775	3	59.155	5	36.595	4
85.229	3	58.794	3	36.303	4
84.699	2	58.251	1b	35.781	6
84.331	2			35.347	4
83.900	5b	57.809	3	34.943	3
		57.296	3	34.526	6
82.913	1	56.843	5	34.132	3s
82.603	3	56.512	1	33.744	6s

## BAND SPECTRUM OF SULPHUR—continued.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
5533·196	5b	5505·771	2s	5478·692	6
		05·278	2b	78·228	3
		04·986	1	77·606	8
32·691	3b	04·681	1	77·023	3b
		04·295	1	76·597	3
32·169	6	03·893	6	76·270	3
31·422	8	03·449	3b	75·770	4
30·767	3	02·589	5	75·346	5
30·214	2	02·213	4	74·950	3
29·901	2	01·350	1	74·351	4b
29·621	4	00·574	4	73·858	3s
28·912	2b	00·398	2	73·374	3
28·521	2	5499·733	6	73·049	2
28·126	4	99·150	2	72·949	4
27·657	4	98·816	1	72·782	2
27·240	2	98·475	3	72·500	1
26·765	1	98·104	2	72·243	3
26·379	3b	97·395	2	71·390	3
25·869	3b	97·014	4	70·780	1
25·438	1	96·703	3	70·278	2
25·154	3	96·372	3	69·931	4
24·680	1n	95·401	5	69·469	3
24·420	2n	94·777	4	69·120	1
23·540	3	94·381	4	68·831	3
22·249	1	93·982	3	68·299	3
		93·505	1	67·886	1
21·963	4	93·312	2	67·624	2
21·232	8	92·803	8	67·053	1
20·521	2	92·105	3	66·556	1
20·150	4	91·605	1	66·183	3
19·515	1	91·418	1	65·896	3
19·145	2	91·103	1	65·658	2
18·761	2b	90·711	2	65·385	1
18·529	1	90·118	4	65·086	2
18·233	2	89·532	5	64·680	4
17·942	3	89·092	2	64·028	2
17·556	4	88·679	4	63·769	1
17·038	4	88·274	2	63·400	1
16·355	5	87·967	3	62·975	1
15·746	1	87·510	9	62·751	1
15·421	1	86·790	10	62·434	2
15·155	1	86·238	1	62·160	3
14·240	4	85·814	4	61·820	1
13·898	3	85·354	2	61·473	1
13·048	4	85·075	4b	61·160	3
12·853	1	84·525	4	60·815	2
12·432	3	83·741	1	60·560	3
11·963	1b	83·492	3	60·168	1
11·309	2b	83·248	2	59·531	1
10·460	3	82·813	4	59·191	2
10·160	1	82·395	2	58·507	4
09·594	2	81·955	3	57·779	2
09·209	3	81·398	6	57·010	3
08·806	5	80·910	2	56·783	
07·637	2b	80·607	2	55·311	
07·115	2	80·198	2	55·010	3b
06·599	4	79·916	5	54·648	3
06·256	1	79·341	6	54·098	2



BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
5453·462	4	5424·171	3	5395·646	1
52·046	2	23·724	3	95·327	4
51·647	4	23·438	1	93·578	2
51·202	1	23·143	5	93·487	1
50·511	2	22·743	2	92·435	2
50·190	3	22·112	3	92·082	3
48·329	2	21·787	1	90·967	1
47·880	3	21·467	4		
47·459	3	21·078	4	90·716	2
47·007	3	20·793	3	90·214	1
46·355	1	20·385	2	89·552	3
45·842	1b	19·994	4	89·049	4
45·044	3	19·479	4	88·517	2
44·683	3	19·100	3	88·182	3
44·152	3	18·609	6	87·504	2
43·867	2	17·827	5	87·105	1
43·153	1b	17·359	5b	86·763	4
41·892	5b	16·580	4	86·188	5
41·504	1	16·232	4	85·861	3
41·189	4	15·149	3	85·014	1n
40·760	4	15·416	2	84·516	1
40·536	6	14·325	4	84·183	4
40·285	3b	13·909	1	83·578	3
39·155	6	13·742	1	83·100	2
38·472	3	13·402	4	82·175	3
38·246	3n	12·959	1	81·759	3
37·875	3	12·709	1	81·466	3
37·565	1	12·427	2	81·281	3
36·870	4	12·061	3	80·918	1
36·440	4b	11·737	2	80·318	3b
35·932	4	11·360	1	79·346	7
35·367	3	11·061	3	78·959	5
34·426	1	10·447	5	78·061	3
33·922	2	09·790	4	77·316	6
33·600	4	09·402	1	76·897	5
32·962	6	09·098	2	76·462	1
32·527	2	08·680	2	76·173	3
31·932	3	08·315	3	75·486	3
	8	07·998	1	75·158	2
31·219	or	07·691	5	74·695	2
	10	07·047	3	74·346	3
30·507	2	06·547	1	73·680	3
30·198	1	06·301	2	73·195	5
29·566	4	05·013	3	72·690	5
29·260	3	04·141	2	72·043	2
28·940	4	02·954	3	71·433	3
28·656	1	02·590	1	71·147	3
28·349	1	01·957	2	70·810	2
28·068	5	01·593	1	70·473	3
27·685	1	01·185	3	69·944	1
27·272	3	00·805	1b	69·673	2s
26·838	1	5399·684	2	69·384	1
26·655	2	99·350	1	68·989	4
26·197	6	98·996	3	68·441	1
25·712	2	98·285	3	68·314	2
25·390	3	96·479	2	67·978	3
24·908	5	96·226	2	67·588	3b
24·514	2	95·841	1	66·993	4

BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
5366·482	5	5333·106	2	5305·501	3
65·380	4	32·817	1	05·113	5
65·355	1	32·525	2	04·404	1
65·093	1	32·153	3	03·962	3
64·697	6	31·522	1n	03·444	5n
64·237	3	30·789	2	03·274	1
63·814	5	30·295	4	01·986	1
63·297	5	29·516	2b	01·381	2
62·896	3	27·921	1	00·924	4
62·520	1	27·671	1	00·476	1
62·140	3	27·369	2	5299·973	2
61·678	2	26·731	1	99·601	1
61·531	2	26·301	5	99·071	3
61·158	3	25·715	4	98·795	3
60·892	1	25·223	2	98·154	1
60·627	3	24·873	1	97·997	2
60·279	4	23·851	2	97·312	2
59·806	5	23·587	2	96·983	2
58·845	4	23·241	2	96·015	2
58·263	3	22·867	2	95·584	2
57·740	2	22·271	1	94·551	1
57·367	3	21·858	3	94·031	3
56·973	4	21·536	3	93·300	3
56·203	2b	21·240	3	92·240	3
55·540	2b	20·651	1	90·799	1b
54·883	1b	20·203	3	90·330	3
54·019	1b	19·835	1	89·848	3
53·062	2b	19·585	2	89·006	2b
52·152	2b	19·311	3	88·259	2b
51·273	3	18·654	4	87·585	3
50·816	1	17·883	5	86·932	1
50·405	3	17·361	1	86·482	2
49·898	2	17·119	2	85·746	3
49·390	1	16·877	1	84·913	2
48·912	2	16·586	2	84·450	2
48·361	2	16·202	4	83·016	2
46·911	3	15·720	2	82·630	2
46·163	2n	15·338	2	82·289	1
		14·998	6	81·579	1
45·194	1n	14·481	2	80·228	1
44·041	2n	14·125	8	79·898	2
43·007	3	13·614	3	79·433	2
42·359	1	13·272	6	78·548	3
41·953	1	12·879	1	78·247	2
40·898	3n	12·506	3	77·876	1
40·121	3	11·760	6	77·440	1
38·777	1	10·621	5n	77·101	1n
38·257	3			76·733	1n
37·890	1	09·823	5	76·378	4
37·476	2	09·410	3	75·901	1
37·285	2	09·071	1	75·528	3
36·556	1	08·191	2	74·276	1
36·127	1	07·847	3	73·990	1
35·510	3	07·525	1	73·592	1
34·833	4	07·121	3	73·323	2
34·234	1b	06·783	1	72·999	3
33·939	1	06·231	3	72·689	2
33·592	3	05·874	2	72·335	1

BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
5271·872	1	5244·577	3n	5212·052	2
71·316	2	43·906	1	11·593	1n
70·558	3	43·212	3		
69·378	1	42·702	2n	10·931	4s
69·089	1	42·282	1	10·617	2
68·833	2	42·027	1	10·017	2n
68·508	2	41·737	2	09·045	2n
67·847	2	40·856	2	08·782	4n
67·401	1	40·069	2	08·306	3b
67·254	1	39·682	2	07·417	3
67·024	1	39·320	2	06·906	5b
66·540	1	38·477	2n	06·409	1
66·155	3	38·114	1	05·737	1
65·512	3n	37·089	2	05·227	6b
		36·527	1	04·779	1
65·109	1	36·079	2	04·296	2
64·917	2	35·472	3	03·710	4
64·044	1	34·131	2	03·341	1
63·500	4n	32·817	1n	02·904	2
63·017	3n			02·465	3
62·484	1n	32·182	1	01·872	2
61·990	1	31·328	2	01·652	3b
61·451	5n	30·792	1	01·156	2
61·247	1	30·329	1	00·756	2
60·608	2	29·835	2	00·333	2
60·269	1n	29·109	1n	5199·956	3
59·841	4	28·457	2	99·582	1
59·552	2	27·943	1	99·309	2
59·192	1	26·798	1	99·000	3
58·607	2	26·155	2	98·475	2
58·340	3	25·734	1	97·817	4b
57·986	1n	25·258	1	97·675	2
57·405	2	24·676	2n	96·769	3
56·803	4	24·454	1n	96·588	2
56·043	2n	23·947	2	95·966	2
55·739	3	23·671	1	95·728	2
55·269	2	23·307	1	94·782	2
54·974	1	22·983	1	94·048	5b
54·534	1	22·245	2	93·436	3b
54·153	4	21·546	2n	92·734	1s
53·756	3	21·274	1n	92·288	2
53·303	2	20·690	3	91·956	2
52·981	2	20·229	2	90·521	1
52·700	3	19·882	1	90·117	3
52·158	3n	19·544	1	88·573	1b
51·677	3	19·201	2	88·100	1
51·359	3	18·668	1	87·335	1
51·118	3	18·037	1	86·880	1
50·512	2n	17·704	4	86·612	1
49·820	3	17·019	3	86·033	1
49·315	2	15·935	1	85·016	1
48·958	2	15·409	3	84·426	3
48·090	3	14·796	3b	83·775	2n
47·126	2	14·451	1	83·063	1
46·801	2	13·835	1b	82·670	1
46·336	3n	13·158	3	82·165	1
45·587	3	12·875	1	81·562	2n
45·015	2	12·594	2	81·169	1



BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
5180·855	2n	5146·732	3b		
78·761	2	46·257	2	5102·903	3
78·043	3b	45·783	4b	02·608	3
76·861	1	45·031	2	02·140	2
76·401	2n	44·482	3	01·965	2
76·361	1n	44·000	2	00·853	2
75·881	1n	43·458	2	00·494	4
75·229	2n	43·131	1	5099·627	2
73·653	2n	42·574	1n	98·972	4
73·171	2n			98·392	2
72·692	1	41·671	2	97·634	4
72·307	1	40·923	1n	96·911	1b
71·175	2	40·448	2n	96·457	1
70·660	1	39·074	1	95·983	2
70·353	2	38·400	2	95·055	2
69·665	1	37·643	1n	94·684	3
68·592	2	37·001	1	94·225	2
68·122	2	36·624	1	93·912	2
66·239	1n	36·113	1	93·098	2
		35·663	2n	92·697	3n
66·142	2n	35·398	2n	92·195	1
65·330	2n	33·270	1	91·949	1n
63·880	3	32·852	1	91·541	2n
63·389	3	29·743	1	90·979	3
63·008	2	28·816	2	90·162	2
61·691	4b	28·220	1	89·388	2n
61·214	2	27·561	1	89·196	1n
60·816	2	26·914	1n	88·322	1n
59·844	5	25·783	1n	87·529	3
59·557	1			86·884	2n
59·148	1n	23·942	1n	86·270	1n
58·916	1n	23·188	1n	84·475	3
58·194	2n	22·682	1n	84·024	2
57·921	2n	21·987	2n	82·964	1n
57·509	1	20·490	1		
57·134	3	19·500	2	82·415	3
56·689	2	18·144	2	81·412	3
56·275	1	17·233	3	80·781	2
55·826	2	15·673	2	80·325	2
55·332	4	14·984	2b	79·334	1b
54·873	2b	13·655	1n	78·503	2
54·379	3	12·976	1n	78·022	1
53·960	3	12·558	1n	77·6 9	1
53·559	1	12·262	1n	75·217	1
53·102	2	11·631	1	74·912	2
52·655	3b	11·279	2	74·576	3
52·281	2	10·943	1	74·086	2
51·929	3	10·152	1	73·586	1b
51·615	1	09·767	1	72·729	1n
51·344	1	09·186	2	71·923	2
50·987	4	08·392	1n	71·629	1
50·583	2	07·832	2n	71·349	1
50·287	1	07·195	3	70·893	1
49·935	2	06·224	2n	70·563	2
49·583	3	05·412	2	70·181	1n
48·917	3b	04·594	2	69·757	2
48·163	4	04·239	3	69·355	1n
47·535	4	03·731	1b		



BAND SPECTRUM OF SULPHUR—*continued.*

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
5068.966	1	5039.277	2	4999.574	2
68.568	3	38.818	3n	99.206	3
68.099	2	38.368	1	98.868	2
67.529	2	37.866	3	98.556	1
66.886	2n	37.004	4	97.989	5b
66.643	2	36.532	2	97.306	2b
65.833	3	35.866	2b	96.658	3b
65.323	2	35.366	2	96.177	3
64.973	1	35.030	1n	95.634	3
64.546	2	34.631	4n	95.141	3
64.219	1	33.881	2	94.718	4
63.825	2	33.261	2n	94.197	4
63.247	1	32.737	1b	93.775	1
62.779	1			93.208	4
62.315	2b	31.510	1b	92.712	2
61.770	2	30.301	2b	92.336	1
61.189	3	28.121	1	91.909	3
60.756	1b	27.485	1	91.642	2
		26.447	1	91.491	2
59.871	4	25.645	1	91.059	2
59.103	3	25.008	1	90.628	2n
58.636	1	24.700	2	90.258	3
58.134	3	24.377	1	89.995	3
57.626	1	22.684	1	89.543	1
56.981	4	22.043	3b	89.182	2
56.493	1	21.495	1	88.494	2
56.071	1	21.003	1	87.317	2n
55.711	3	20.525	2	87.371	1
55.444	2	19.483	2b	85.737	1
55.086	2	18.593	1b	85.304	1n
54.862	1	17.820	1	84.526	1
54.463	1b	17.096	1n	83.842	1
53.057	1	16.772	2n	83.385	1
53.290	8	15.790	1b	82.675	2
52.545	3	15.215	2b	82.162	1n
52.119	1	14.173	3n	80.833	1
51.440	5	13.449	1n	80.387	4s
51.044	5	12.821	2	79.706	1n
50.370	2	11.703	4	78.830	1n
49.590	3	11.099	3	78.083	1n
	1	10.436	2	77.286	2
48.953	2	09.677	2	76.617	1
48.544	1	09.322	1	75.282	1
48.137	2	08.988	2s	74.566	2
47.790	4	08.224	2n	73.674	1
46.730	2	07.057	3b	72.641	1
46.266	4s			71.915	1n
45.418	2	05.971	2b	70.935	1n
44.712	5	05.304	3	70.103	1
43.930	3b	03.968	2	69.433	1
43.297	4	03.713	2	68.786	1
42.770	2n	03.178	2	68.638	2
42.438	1	02.765	1n	67.576	1
41.976	3	02.020	4	67.046	1
41.438	3	01.375	3	66.176	1
40.887	4	00.578	3	65.747	1
39.694	3	00.013	2	65.549	1

BAND SPECTRUM OF SULPHUR—*continued.*

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4964·764	3	4925·558	1n	4892·772	3b
63·511	2b	25·008	1n		
62·962	1	24·355	1n	90·525	3
62·341	2	23·598	1	89·858	1n
61·002	1	23·244	1b	89·406	1n
60·404	2	23·036	2b	88·933	1n
59·968	1	22·422	1	88·663	1n
58·993	1	22·038	1	87·852	2n
58·458	1			87·429	2n
58·264	2			85·144	2n
56·692	1	17·827	2b	84·577	1n
56·193	2	17·213	1b	84·205	2n
55·625	2b	16·603	1	83·751	1n
		16·260	1	82·399	1n
54·670	1	15·980	1	81·910	1n
54·056	1n	15·304	1n	81·214	3n
53·728	2	14·505	4	80·245	2n
53·300	1	13·684	3	79·754	1n
53·156	2b	13·214	1n	78·913	2n
52·248	1	12·617	1n		
51·889	2b	12·133	3		
51·020	2	11·260	2		
50·455	2b	10·984	2	75·980	2n
49·362	2	09·882	2n	75·541	3n
48·850	3	09·715	2	74·927	1
48·458	1	09·299	1	74·455	1n
47·790	3	08·818	3	73·897	1n
47·408	3	08·446	1	73·164	1n
46·968	1	07·653	3	72·732	1n
46·464	1	06·995	1	72·237	1b
46·006	1	06·210	2n	71·931	1
45·609	1			71·172	3b
45·195	1	05·557	2	70·583	2b
44·803	2	05·088	1n	70·141	1b
44·179	1	04·793	1n	69·559	1b
43·903	1	04·337	3n	68·609	2b
43·555	3	04·020	3	68·447	4b
43·169	2	03·452	3	67·300	2
42·909	1	03·045	2	65·827	4
42·439	2b	02·606	1n	64·823	2b
41·989	2	02·198	1	64·286	1b
41·552	1	01·610	4	63·839	2b
41·174	1	01·108	2	63·366	4
40·737	1n	00·249	1b	62·881	2b
40·403	3				
39·871	3	4899·780	3		
39·317	1	99·456	1	62·390	2
39·010	2	99·077	2	62·034	1
38·531	1	98·394	4	61·169	4
38·245	2	97·921	2	60·656	3
37·471	2	96·968	3b	60·178	3
36·995	3			59·465	1
36·588	1	96·315	3	58·956	3
35·966	1n	95·654	3	58·476	4
35·219	1	95·290	1	58·107	1
34·592	3	94·593	3b	57·626	1
27·070	1b			56·827	5
26·222	2b	93·603	1n	56·490	2

BAND SPECTRUM OF SULPHUR—*continued.*

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4855·803	2b	4770·730	1	4749·189	3
55·273	3	70·540	1n	48·601	1n
54·898	1	70·009	1	48·416	2
54·539	1	69·508	2	48·101	3n
54·190	2n	69·259	2	47·786	1
53·726	2n	68·566	2	47·533	2
53·255	2b	68·273	1	46·847	1
52·805	2	67·939	1	46·263	1
		67·635	1	46·085	2
52·281	2	67·342	2	45·611	1b
51·702	1	66·542	2	45·252	2
51·342	3s	66·220	2	44·392	2
51·029	3s	65·504	1	43·967	1
50·180	2	65·221	2	43·741	1
49·707	3	64·762	1	43·465	1b
49·249	3	64·557	1n	42·973	3
48·701	1	64·195	3	42·572	1b
48·230	3b	63·756	2	42·153	2
47·519	2	63·476	1	41·552	1
47·088	2	63·256	1	41·148	1
46·762	2	63·042	2	41·083	2
46·124	3	62·749	1	40·680	1b
45·709	2	62·265	2	40·396	1b
45·346	1b	62·098	1	39·985	1
44·599	2	61·397	4	39·821	2
44·298	1b	60·916	1n	39·673	2
43·612	1	60·437	3b	39·384	1
42·364	2b			38·992	2
41·697	1b			38·030	2
40·666	2b	59·854	2	37·471	2n
40·187	1b	59·547	1	37·188	1
39·562	2	59·343	1	36·918	1n
4784·744	1	59·020	1	36·659	2
84·243	1	58·466	2	35·814	2
83·665	1	57·886	2	35·568	1b
83·039	1	57·818	2	35·051	2b
82·779	1			34·327	1
81·948	1	57·054	2b	33·926	4b
81·738	1			33·314	1
80·787	1n	56·367	2	33·117	1
80·396	1	56·064	1	32·982	1
80·170	1	55·757	4n	32·902	1
79·179	1	54·985	2n	32·544	1
78·738	1	54·784	2n	32·416	1
78·029	2	54·489	2n	31·947	2
77·641	2	53·379	2	31·649	4b
77·128	1n	53·150	2	31·117	1
76·656	1	52·680	2n	30·893	1
75·656	1	52·021	2	30·662	1
75·468	1	51·740	2	30·182	1
75·154	2	51·615	2	29·822	2n
74·794	1	51·144	1n	29·604	1
74·164	2	50·868	2	29·424	1
73·377	2	50·626	1	29·244	2n
72·910	3n	50·239	2	28·825	1
71·729	1	50·029	2	28·563	2
71·285	2	49·722	1	27·856	1
70·912	1	49·471	2	27·733	1

BAND SPECTRUM OF SULPHUR—*continued.*

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4727.520	1	4709.236	3b	4690.619	3
27.067	2			90.350	1n
26.691	2	08.972	1	89.793	1
26.208	3b	08.813	3	89.602	3
		08.162	1	89.278	2
25.570	2	07.935	2b	88.687	4b
25.165	1	07.514	4		
24.717	3n	07.088	1	88.110	3
24.341	2	06.808	3	87.920	3
23.901	2n	06.439	4b	87.675	1
23.756	1			87.423	1
23.378	2s	06.046	1	87.220	2
22.893	2b	05.702	4	87.081	2
22.559	3	05.356	2b	86.814	2
22.221	4			86.574	3
21.971	1	05.142	1	86.209	1
21.695	1	04.814	3	85.834	2
21.482	2	04.173	2b	85.453	4
21.194	2			85.243	2
20.607	3b	03.658	2	85.053	2
20.172	1	03.223	4	84.755	3
19.783	2	02.896	1	84.503	2
19.199	2	02.585	1	84.384	2
18.644	3	02.407	1	83.969	4
18.178	4	02.114	2	83.760	4
17.798	1	01.775	4	83.159	1
17.505	2	01.360	4	82.877	2
17.185	1	00.835	1	82.617	2b
16.737	1	00.579	1	82.378	2
16.540	1	00.397	1n	82.058	3
16.283	3	00.244	2	81.671	1
16.084	1	00.036	3	81.537	3s
15.799	3	4699.628	2	81.240	3b
		99.303	1	80.406	3
15.318	2	99.010	1	80.183	1
14.813	2	98.489	3	80.076	3
14.579	3	98.250	1	79.761	3b
14.392	2	97.871	2b	79.418	4
14.235	1	97.421	3b	79.135	4
14.098	3	97.079	1		
13.860	2	96.911	2	78.509	2
13.556	2	96.773	2	77.957	4
13.365	1	95.705	1	77.762	2
13.109	2b	95.387	1	77.581	1
12.826	4b	95.100	2	77.407	1b
12.477	1	94.596	2b	77.047	3
12.356	1	94.331	3b	76.810	4
12.034	2	94.063	1	76.348	1
11.624	1n	93.828	2b	76.157	2
11.391	2			75.816	4
11.137	3	93.100	2		
10.941	2	92.756	1	75.485	3
10.578	2b	92.526	2	75.044	6
		92.174	1	74.731	3
10.270	1	91.727	2	74.655	2
10.030	3	91.360	4	74.432	1
09.796	1	91.147	1		
09.579	1				



BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4673·953	i	4661·876	1	4645·448	1b
73·784	5b	61·799	4	45·110	1
73·402	1	61·593	1	44·734	2
73·296	4	61·446	1	44·509	1
73·065	2n	61·179	1	43·994	4
72·883	3n	60·863	8	43·568	3
72·824	3	60·443	4	43·247	3
72·424	3	60·265	1	42·297	3
72·176	3	60·044	1	41·927	1
71·940	3	59·647	8	41·736	1
71·572	3	59·493	6	41·506	4
71·383	1	59·270	4	41·255	2b
71·268	2	58·793	2	40·831	6
70·990	2	58·505	4b	40·460	4b
70·675	6			39·805	3
70·435	2			39·373	3b
70·329	6			39·196	2
		57·975	3	38·540	3
		57·496	3	38·331	2b
		57·188	8		
		56·495	3b	37·946	1
70·122	6			37·723	2
69·883	6	56·140	6	37·363	1
69·474	1	55·691	2	36·802	3
69·475	5	55·348	3	36·621	2
69·042	3	54·131	3	36·375	2
68·801	4	54·863	4	35·943	2
68·483	4	54·596	4	35·564	1
68·338	3b	54·233	5	35·269	2b
68·040	3b	53·948	1	34·865	1
67·892	4	53·841	1	34·762	1
67·681	1	53·631	2b	34·527	4
67·554	1			34·328	4
67·369	3	53·112	1	33·715	5
67·147	1b	52·971	3	33·155	1
66·932	3b	52·565	4	32·991	1
66·787	1b	52·323	8	32·711	3
66·646	3	52·128	2	32·460	3
66·333	6	51·848	3	32·279	1
65·970	2	51·331	2	32·139	4
		51·088	4	31·584	3b
65·712	2	50·814	3	31·193	2
65·357	6	50·623	3	30·924	1
64·988	4b	50·493	1	30·753	2
64·721	4b	49·993	2	30·514	1
64·381	4b	49·404	6	30·409	3
64·184	1	48·817	1	30·214	2
64·036	3	48·629	1	30·053	2
63·803	2b	48·399	3	29·652	1
		48·082	1	29·342	3
		47·980	1	28·887	1
63·622	4	47·660	2	28·659	1
63·435	1	47·385	1	28·483	2
63·163	5	47·047	1n	28·202	3
62·796	2s	46·892	1n	28·014	2
62·431	2b	46·709	4	27·486	1
62·220	4	46·404	4	27·366	1
62·099	1	45·761	4	27·101	2

BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4626·917	1	4612·585	1	4593·533	2
26·704	2	12·327	4	92·784	3
26·465	2b	11·950	3	92·190	2b
		11·672	3	91·815	2n
		11·184	3	91·591	1
26·079	3	10·810	5	91·420	2
25·639	1	10·470	6	90·985	1n
25·419	3	10·159	2	90·712	2
25·239	2	09·546	4	90·533	1
24·983	3	09·158	3	90·509	2
24·571	2	08·786	2	90·062	1
24·321	2	08·633	2	89·818	2
24·194	3	08·284	2	89·458	2
23·834	3	07·900	3	89·164	2
23·613	2	07·447	2	88·936	1
23·399	2	07·146	3	88·551	1
23·084	1	06·744	1	88·423	2
22·853	2	06·493	2b	88·051	2
22·578	2			87·921	1
22·379	3	06·104	3	87·616	2
21·876	3	05·676	2	87·218	3
21·703	1	05·492	1	86·855	1n
21·285	1	05·288	1	86·594	1n
21·124	1	05·056	4	86·415	1
20·901	4	04·528	3	85·987	2
20·682	3	04·209	3	85·760	1
20·542	2	03·989	1	85·634	1
20·418	3	03·747	1	85·407	3
19·770	2	03·488	4	85·175	1
19·541	2	03·127	3	84·908	1
19·368	3	02·913	2	84·666	1
19·211	3	02·509	6	84·477	4
18·997	2	01·789	1	84·288	2
18·850	1	01·546	2b	84·016	1
18·705	2	01·259	1	83·834	2b
18·384	1	00·835	3s	83·626	1
18·233	2	00·386	3n	83·514	1
17·953	4	4599·825	2n	83·331	2b
17·720	1	99·407	1n	83·086	1b
17·482	1	98·488	1	82·673	2
17·161	4	98·347	2	82·321	1n
16·908	4	98·091	2b	82·111	3
16·761	5	97·757	1	81·835	2
16·208	1	97·408	4b	81·674	1
16·081	1	96·751	1b	81·317	1n
15·784	4	96·497	1	81·058	1
15·466	3	96·297	1	80·890	2
15·188	2	95·964	2	80·497	2
14·786	4	95·577	2	80·022	1
14·574	3b	95·435	1	79·625	1n
14·212	3	95·252	2	79·384	2
13·925	2	95·010	2	79·087	1
13·737	2	94·730	1	78·808	2
13·566	1	94·587	1	78·528	1
13·478	1	94·391	2	78·363	1
13·350	3	94·257	1	78·068	1
13·204	2	94·012	1	77·884	1
12·968	2	93·635	2	77·548	4

BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4577.192	4	4561.012	1	4546.926	3
76.987	1	60.841	3	46.745	1
76.682	1	60.483	3	46.582	3
76.388	1	60.194	3	46.336	3
76.210	3	59.882	1	46.196	1
75.953	1	59.743	1	46.067	2
75.625	2	59.601	2	45.624	2 <sub>s</sub>
75.503	1	59.311	2	45.185	3b
75.122	2	58.952	1		
74.939	2	58.770	2	44.978	1
74.698	2	58.581	2	44.771	3
74.133	4	58.267	1	44.540	6
73.890	1	57.946	3	44.275	2
73.602	4	57.495	4	44.062	4
73.208	2b	57.223	3	43.866	2
72.966	2b	56.871	3	43.736	1
72.704	3	56.437	1	43.570	2
72.273	3	56.151	3	43.284	2
71.998	1	55.928	1	42.822	4
71.872	1	55.817	2	42.617	2
71.479	1	55.701	1	42.386	6
71.312	1	55.481	1	41.948	4
71.152	2	55.252	6	41.229	3
70.982	1	54.794	5b	40.948	10b
70.765	2			40.777	10b
70.292	4	54.346	1	40.655	10b
70.037	1	54.237	1	40.395	2
69.526	3	53.859	1	40.244	2
69.277	2	53.756	1	39.997	4
68.990	1	53.616	2	39.726	4
68.581	2	53.284	2	39.470	4
68.187	3	53.112	2	39.194	2
67.674	1	52.962	1	38.982	3
67.435	2	52.272	1	38.681	4
67.325	2	52.553	3	38.438	2
67.124	2	52.392	1	38.192	1
66.830	2n	52.211	3	38.003	2
66.597	1n	51.966	1	37.778	5
66.404	3	51.741	3	37.490	5
65.880	1	51.403	3	37.181	4
65.713	2	51.027	1	36.958	4
65.635	2	50.764	4	36.774	1
65.335	1	50.445	4	36.647	1
65.198	1	49.993	1	36.572	2
65.062	1	49.628	3	36.361	4
64.798	3b	49.581	1	36.005	8
64.437	1	49.346	1	35.678	1
64.230	3	49.091	4b	35.398	8
63.864	1			35.027	10
63.552	3	48.716	1		
63.412	3	48.524	4	34.675	1
63.104	1	48.336	3	34.487	2
62.955	3	48.182	2	34.292	1
62.668	1	47.765	2b	34.135	3
62.498	2			33.883	3
61.990	1	47.442	4	33.569	5
61.651	2	47.235	1	33.254	4
61.360	3	47.109	1	33.054	1



BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4532·762	8	4517·837	2	4502·509	1
32·583	1	17·635	1	02·325	2
32·327	4	17·407	2	02·106	3
31·895	1	17·096	3	01·943	2
31·661	3	16·947	3	01·762	2
31·476	1	16·433	2	01·333	4
31·253	4	16·177	3	01·191	8
30·992	6b	15·816	6	00·922	8
30·547	6b	15·565	4	00·578	4
30·190	4	15·320	3	00·439	2
29·995	3	15·127	1	00·128	4
29·785	3	14·888	1	4499·766	2
29·564	3	14·667	4	99·579	2
29·347	3	14·472	3	99·400	1
29·252	3	14·244	3	99·274	5
28·967	1	13·707	4	99·052	1
28·655	3	13·399	5	98·873	2
28·340	5b	13·118	3	98·645	3
27·949	1b	12·836	1	98·480	2
27·809	4b	12·650	4	98·149	8
27·580	1n	12·349	1	97·888	3
27·494	1n	12·209	1	97·672	2
27·097	4	12·102	1	97·524	2
26·740	2	11·936	3	97·330	4
26·478	3	11·734	1	97·203	4
26·298	1	11·537	1	96·995	1
25·905	4	11·345	2	96·828	6
25·651	2n	11·054	6	96·566	1
25·535	2n	10·791	5	96·462	3
25·277	1	10·534	1	96·373	3
25·077	2	10·212	1	96·178	8
24·763	4	10·015	6	95·944	4
24·408	1	09·516	6	95·646	4
24·198	5	08·999	8b	95·494	4
23·782	8			95·242	4
23·660	4	08·491	4	95·237	5
23·348	2	08·013	2	94·993	1
23·208	1	07·871	2	94·596	6b
23·083	2	07·749	1	94·508	6
22·861	3	07·456	4	94·023	3
22·581	2	07·188	4	93·807	4
22·400	2	07·057	4	93·637	4
22·027	2	06·854	1	93·281	2
21·667	4	06·489	4	93·045	5
21·338	2	06·227	6	92·805	3
20·999	1	05·821	3	92·679	4
20·797	2	05·572	3	92·310	2
20·614	3	05·368	1	92·187	2
20·081	3	05·172	2	92·096	2
19·750	4	04·946	8	91·835	3
19·511	2	04·416	2	91·472	4
19·211	2	04·229	2	91·289	1
19·074	1	03·964	5	91·110	4
18·665	3	03·713	3	90·806	5
18·492	1	03·558	3n	90·579	4
18·370	1	03·295	4s	90·375	1n
18·181	1	02·917	6	90·180	5
18·067	2	02·730	2	89·911	4



BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4489·717	1	4476·098	2b	4462·573	2
89·320	10	75·867	2b	62·421	1
89·085	8	75·558	1	62·329	1
88·836	2	75·373	1	61·660	3
88·680	1	75·223	5	61·406	2
88·604	1s	74·910	1	61·015	4
88·574	1s	74·757	1	60·415	4
88·215	6	74·598	2	60·206	2
87·908	6	74·281	1	60·030	3
87·596	8	74·178	1	59·826	1
87·124	3	73·899	2b	59·628	1
86·876	6			59·519	1
86·743	3	73·614	4	59·200	2
86·495	5	73·352	4	58·855	3
86·206	5	73·107	1	58·503	4
85·877	2	72·948	1	58·293	4
85·803	2	72·574	4	57·814	3n
85·591	6	72·204	4	57·634	3n
85·401	6	72·139	2	57·429	2
85·067	5	71·964	6	57·300	2
84·851	5	71·714	1	57·083	1
84·616	5	71·537	2	56·903	2n
84·375	5	71·288	1	56·708	2n
83·891	3b	71·198	1	56·523	2n
		70·985	1	56·407	2n
83·657	4	70·667	5	56·226	1n
83·476	2	70·439	1	56·118	1n
83·289	3	70·363	1	55·916	1
83·109	3	70·171	3	55·738	2
82·835	5	70·063	1	55·538	3
82·637	2	69·849	2	55·386	3
82·400	4	69·497	2b	55·211	2
82·219	4	68·997	3	55·115	2
81·983	5	68·565	2	54·802	1
81·787	5	68·304	2	54·684	1
81·632	5	68·219	2	54·504	3
81·412	2	67·964	3	54·343	1
81·136	8b	67·735	3	54·176	1
80·912	1	67·566	1	54·048	2
80·779	1	67·259	2	53·855	1
80·501	8	67·088	3	53·479	5
80·262	2	66·883	1	53·306	5
80·092	2b	66·727	1	53·098	1
79·782	3	66·488	2	52·667	4
79·523	2	66·201	2	52·303	1
79·346	2	66·060	2	52·090	1
79·265	4	65·820	2	51·973	1
79·047	1	65·592	3	51·751	1n
78·893	1	65·232	2	51·562	1
78·647	3	64·798	3	51·371	3
78·390	2	64·503	3	51·073	2n
78·187	1	64·294	1	50·881	3n
78·023	1	64·210	1	50·608	3n
78·020	8	63·850	4	50·296	2n
77·448	3	63·447	2n	50·0 9	4
77·091	3	63·166	2	49·608	4
76·924	3	63·002	1	49·247	4
76·403	5	62·868	1	48·993	1

BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4448.751	1	4433.123	1	4414.842	2
48.443	1	32.865	1	14.603	1
48.112	5	32.643	2	14.281	2
47.886	3	32.085	1	14.100	3
47.171	2	31.923	1	13.774	2
47.017	2	31.643	2	13.574	1
46.787	1	31.349	1	13.421	1
46.611	2	30.898	1b	13.139	2
46.437	2	30.401	2b	12.896	1
46.313	2	29.955	1b	12.548	2
46.094	1	29.726	1b	12.373	2
45.916	1	29.131	1b	12.001	2
45.567	2	28.792	3	11.682	2
45.476	2	28.421	1	11.448	1
45.161	2	28.030	1	11.178	1b
44.947	2	27.714	1	10.920	1
44.798	2	27.569	1	10.745	1
44.365	1	27.179	1	10.630	1
44.208	2	26.932	2	10.293	2
43.780	1	26.559	1b	09.907	2
43.474	2			09.705	1
43.389	2	25.884	2b	09.494	2
43.287	2	25.044	1	09.319	2
42.914	3	24.797	1	09.107	1
42.591	4	24.487	3b	08.602	3
42.078	1	24.200	1	08.178	2
41.890	1	23.999	1	07.892	2
41.750	2	23.749	1	07.798	1
41.595	3	23.659	2	07.400	1
41.419	2	23.249	1	07.171	1
41.045	1	23.014	1	07.019	1
40.883	2	22.861	1	06.874	1
40.701	2	22.554	1	06.754	2
40.442	3	22.201	3	06.517	3
40.140	1	21.731	1	06.317	1
39.669	3	21.395	1	06.117	2
39.441	4	21.201	1	05.698	2b
38.678	3	20.904	1b	05.415	1
38.542	3	20.617	2	05.156	2
37.708	2	20.290	2	04.161	4
37.653	3s	19.856	3b	03.867	1
37.148	1	19.687	1	03.633	4
36.906	3	19.401	1	03.318	1
36.801	3	19.079	1	03.012	2
36.450		18.862	2	02.750	1
36.196	4	18.430	3b	02.594	1
35.937	2			02.133	4
35.686	2			01.499	4
35.598	2	17.836	1	01.433	1
35.215	3	17.498	3	01.015	2
35.132	3	17.040	1	00.944	2
34.742	1	16.691	2	00.730	2
34.596	2	16.411	2	00.536	3
34.429	1	15.948	1	00.289	2
34.173	1	15.488	1	4399.961	2
33.997	4	15.319	1	99.760	1
33.583	1	15.140	1	99.580	2
33.2 0	1	14.979	2	99.460	2

BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4399.172	1	4382.873	4	4369.613	2
98.889	2	82.699	3	69.299	3
98.712	2	82.495	3	69.113	3
98.425	5	82.306	1	68.685	6
97.836	1	82.179	2	68.418	5
97.623	6	81.877	4	68.266	5
97.141	1	81.623	3	67.951	3
96.889	4	81.538	2	67.746	4b
96.549	2	81.396	2	67.466	8
96.180	4	81.259	1	67.146	1
95.605	4	81.131	2	66.968	10
95.250	1	80.731	6	66.678	3
94.886	6	80.373	6	66.468	1
94.321	6	79.971	3	66.202	10
94.101	5	79.715	3b	65.829	8
93.751	1			65.507	5
93.742	3	79.531	1	65.129	4
93.631	3	79.259	8	64.911	4
93.421	1	79.020	4	64.745	4
93.172	2	78.610	6	64.481	8
92.936	1	78.321	1	64.208	8
92.768	4	78.114	4	63.919	8
92.471	6	77.894	4	63.730	4
92.134	1	77.609	4	63.482	4
91.941	4	77.499	4	63.262	5
91.655	1	77.188	8b	62.946	8
91.479	4			62.757	4
91.306	2	76.867	4	62.488	8
91.005	3	76.710	4	62.037	10
90.751	2	76.423	3b	61.668	8
90.331	5			61.357	6
90.099	2	75.964	4	61.053	5
89.919	1	75.739	4	60.809	6
89.574	4	75.542	4	60.394	5
89.155	3	75.323	3	60.196	1
88.858	3	75.039	4	60.032	2
88.495	4	74.832	4	59.867	3
88.144	5	74.568	3	59.641	6
87.842	2	74.394	1	59.500	1
87.636	4	74.310	1	59.358	2
87.350	1	74.108	4	59.115	8
87.208	2	73.918	2	58.859	3
86.917	4	73.744	2b	58.743	1
86.745	3	73.622	5	58.586	4
86.457	4	73.477	6b	58.402	3
85.849	3	73.065	8	58.029	4
85.615	5	72.531	3	57.829	6
85.441	1	72.289	3	57.618	1
85.010	5	72.059	4	57.414	1
84.945	4b	71.754	5	57.232	1
		71.461	5	56.909	6
84.661	1	71.254	1	56.695	4
84.355	4	71.004	4	56.469	3
84.125	1	70.696	5	56.167	6
83.949	3	70.396	2	55.875	6
83.520	3	70.326	2	55.677	5
83.330	2	70.059	5	55.508	6
83.155	1	69.859	2	55.207	6



BAND SPECTRUM OF SULPHUR—*continued*.

* Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4354·973	1	4342·966	2	4329·820	8
54·783	2	42·815	2	29·415	5
54·628	2	42·733	2	29·162	5
54·474	1	42·391	3	28·799	5
54·293	3	42·144	2	28·675	5
54·182	3	41·925	2	28·439	4
54·074	3	41·818	6	28·230	1
53·896	1	41·572	1	28·118	2
53·782	1	41·372	6	27·945	4
53·560	1	41·056	1	27·646	6
53·387	2	40·855	6	27·445	6
53·264	1	40·587	3	27·149	8
53·052	4	40·439	4	26·794	1
52·827	4	40·088	6	26·606	2
52·527	4		1	26·420	3
52·339	1	39·839	6	26·172	5
52·197	1	39·421	4	25·786	1
52·002	2	39·319	4	25·633	1
51·838	1	39·100	5	25·447	3
51·709	5	38·907	1	25·213	1
51·212	1	38·746	3	25·058	2
50·984	4	38·532	2b	24·938	4
50·745	1	38·097	6	24·787	4
50·667	1	37·754	2	24·595	1
50·475	2	37·572	1	24·456	2
50·282	1	37·317	2	24·312	3
50·177	3	37·257	2	24·132	1
50·073	3	37·050	1	23·782	5
49·811	2	36·854	2	23·212	3
49·665	1	36·645	8	22·989	3
49·522	1	36·350	6	22·788	2
49·384	1	36·174	6	22·590	3
49·207	5	35·824	5	22·425	3
48·883	3	35·687	5	22·216	3
48·489	8	35·371	4	22·102	2
48·120	1	35·178	4	21·942	1
47·957	4	34·839	1	21·817	ln
47·792	4	34·763	6	21·726	2
47·667	4	34·454	5	21·624	3
47·447	4	34·185	4	21·422	5
47·246	3	34·117	4	21·217	1
47·040	2	33·803	6	21·158	1
46·871	1	33·632	6	20·925	3
46·712	5	33·441	1	20·795	5
46·445	3	33·299	1	20·692	3
46·061	8	32·801	8	20·328	2
45·680	2	32·783	1	20·164	4
45·534	5	32·618	1	19·884	5
45·232	3	32·381	6	19·614	4
45·019	4	32·145	1	19·416	1
44·763	3	31·962	8	19·225	3
44·560	3	31·623	5	19·085	3
44·339	4	31·310	5	18·907	5
44·106	6	31·108	2	18·636	2
43·886	1	30·990	6	18·485	2
43·674	8	30·687	3	18·310	5
43·488	8	30·541	1	18·009	5
43·165	4	30·252	10b	17·790	5



BAND SPECTRUM OF SULPHUR—*continued.*

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4317.258	4	4303.860	3	4290.281	1
17.155	3	03.688	1n	90.145	1
17.062	3	03.246	3	89.979	2
16.969	1	03.137	3	89.763	4
16.753	4	02.883	1	89.435	2
16.491	2	02.606	6	89.214	3
16.225	4	02.338	1	89.083	3
15.943	3	02.182	4	88.880	1
15.740	3	01.972	1	88.781	2
15.478	1	01.891	1	88.549	2
15.255	2	01.688	3	88.397	1
15.020	8	01.502	1	88.176	4
14.814	3	01.320	2	87.956	1b
14.573	1	01.016	5	87.725	4
14.267	1	00.857	1	87.491	3
14.080	6	00.701	2	87.305	1
13.694	2n	00.511	4	87.151	1
13.287	8	00.313	2	86.770	2b
13.090	1n	00.179	1	86.620	2b
12.800	4	00.003	1	86.419	1
12.643	1	4299.822	1	86.250	3
12.459	4	99.541	2	85.986	5
12.202	3	99.216	4		
12.019	3	98.951	3		
11.773	3	98.741	1	85.144	4
11.614	1	98.588	1	84.795	3b
11.361	3	98.365	2	84.386	2b
11.158	4	98.235	3	84.169	2b
10.959	1	97.894	2	83.967	4
10.869	1	97.511	2	83.627	3
10.627	4	97.076	3	83.204	2
10.427	4	96.972	5	82.832	2
10.078	5	96.662	3	82.615	1
09.752	4	96.325	1	82.483	3
09.495	4	96.318	3	82.169	2
09.264	1	95.875	5	82.059	2
09.075	3	95.598	3b	81.908	3
08.797	3	95.353	3	81.676	2
08.556	1	95.135	1	81.342	2
08.376	3	94.839	5	81.128	2
07.904	2	94.503	4b	80.798	3
07.795	2	94.310	2	80.626	1
07.470	5	94.164	1	80.480	2
07.250	1	93.895	1	80.253	3
07.122	3	93.768	3	80.107	1
06.888	1	93.484	5	79.909	2
06.680	2	93.039	2	79.561	3b
06.427	1	92.939	4	79.183	2
06.272	1	92.409	3	79.075	2
06.084	5	92.239	3	78.730	2
05.844	2	91.995	3	78.566	2
05.606	1	91.668	2	78.473	1
05.304	4	91.428	3	78.246	4
05.009	4	91.210	1	77.911	2b
04.772	1	91.043	5	77.719	5
04.599	1	90.762	1	77.500	2
04.455	3	90.591	3	77.313	2
04.058	3	90.421	1	76.929	1

BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4276.758	2	4263.256	4	4250.982	1
76.591	2	63.133	1	49.850	3
76.312	4	62.758	2	49.631	1
76.205	4	62.490	4	49.280	2
75.906	3b	62.212	1	48.921	2
75.658	1	61.966	2	48.655	4
75.522	1	61.759	2	48.479	1
75.297	3	61.407	3	48.215	1
75.087	1b	60.963	2	48.109	3
74.877	2b	60.756	1	48.012	3
74.752	1b	60.639	2	47.817	1b
74.175	4	60.222	2	47.580	2
73.957	2	59.967	1	46.998	2
73.602	1	59.804	2	46.789	3
73.423	3	59.678	3	46.597	2
73.285	3	59.499	2	46.317	2
72.880	1	59.335	1	46.052	1
72.805	1n	59.019	3	45.901	4
72.567	2	58.897	1	45.704	1
72.369	2	58.681	1	45.677	4
72.254	2	58.532	1	45.156	3
71.540	2	58.273	3	45.006	2
71.345	2	58.086	2	44.843	1
71.078	1	57.843	4	44.783	1
70.811	3b	57.616	2	44.566	2
70.511	4s			44.395	1
70.083	2b	57.275	5	44.228	2
69.832	2	57.026	1	43.944	2b
69.623	4	56.944	1	43.725	3
69.432	3	56.699	2b	43.540	2
69.223	1	56.493	2	43.311	1n
68.996	1	56.115	2b	43.201	1n
68.743	1b	55.842	3	42.986	3
68.570	4	55.662	1s	42.733	1
68.239	4	55.580	1s	42.554	2
68.007	1	55.287	3b	42.350	2b
67.846	1	54.953	2	42.081	2
67.676	1	54.815	1	41.901	2
67.411	3b	54.625	2	41.745	3
67.195	1	54.405	3	41.595	1
66.996	1s	54.102	3	41.462	4
66.819	2b	53.960	3	41.192	1
66.400	3	53.282	5	41.068	2
65.986	3	53.108	2	40.835	3
65.913	2	52.884	3	40.583	2
65.685	2	52.594	1	40.339	8
		52.402	1	39.840	3b
65.439	4	52.274	2	39.288	3
65.258	1	52.164	2	38.976	4b
64.991	3	51.962	3	38.769	3
64.784	1	51.643	1	38.557	4
64.565	1	51.510	4	38.187	4
64.329	3n		b	37.894	4
64.141	2	51.273	3	37.608	4
64.029	1	50.795	1	37.402	1
63.892	2	50.679	1	37.164	4
63.671	2s	50.595	2	36.857	5
63.551	1n	50.289	1	36.581	3

BAND SPECTRUM OF SULPHUR—*continued.*

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4236·392 } 36·234 } 35·812 } 35·766 } 35·625 } 35·363 } 35·058 } 34·629 } 34·358 } 34·164 } 33·968 } 33·677 } 33·453 } 33·266 } 33·148 } 32·921 } 32·766 } 32·415 } 32·100 }	2 1 2 2 4 1 4 3 3 6 } b 6 } 1 3 1 2 } b 2 } 2 8 6	4223·041 } 22·810 } 22·667 } 22·480 } 22·221 } 22·150 } 21·966 } 21·811 } 21·592 } 21·423 } 21·221 } 20·990 } 20·660 } 20·588 } 20·311 } 20·074 } 19·881 } 19·647 } 19·411 } 19·266 } 19·105 } 18·718 } 18·544 } 18·282 } 18·044 } 17·905 } 17·736 } 17·534 } 17·374 } 17·219 } 16·962 } 16·809 } 16·682 } 16·451 } 16·269 } 16·070 } 15·841 } 15·669 } 15·539 } 15·272 } 15·189 } 14·656 } 14·106 } 13·799 } 13·513 } 13·186 } 12·990 } 12·796 } 12·646 } 12·404 } 12·232 } 11·901 } 11·763 } 11·610 } 11·450 } 11·343 } 11·256 } 11·051 }	1 2 3 4 3 3 1 8 1 8 1 8 2 5 8 4 3 5 4 3 2 4 4 8 3 1 5 2 4 4 5b 4 3 8 1 2 6 4 5 5 4 3 5 4 4 4 3 4 4 4 3 2 2 2 2 2 2 3	4210·943 } 10·758 } 10·650 } 10·453 } 10·324 } 10·139 } 10·006 } 09·745 } 09·519 } 09·287 } 09·011 } 08·729 } 08·499 } 08·299 } 07·946 } 07·702 } 07·525 } 07·311 } 07·144 } 06·822 } 06·609 } 06·409 } 06·235 } 05·962 } 05·778 } 05·592 } 05·326 } 05·037 } 04·827 } 04·543 } 04·134 } 03·907 } 03·798 } 03·563 } 03·454 } 03·279 } 03·162 } 03·045 } 02·888 } 02·700 } 02·378 } 01·910 } 01·514 } 01·291 } 01·184 } 00·986 } 00·553 } 00·423 } 00·205 } 4199·853 } 99·660 } 99·431 } 99·139 } 98·881 } 98·698 } 98·459 } 98·272 } 97·917 }	3 3 3 2 2 1 3 5 4 4 5 5 3b 2 6 4 5 5 3 5 3 2 3 4 2 4 6 2 5 2 4 4 3 3 1 1 2 4 3 6 1 1 8 1 3 5 4 3 3 2 1 6 4 4



BAND SPECTRUM OF SULPHUR—*continued.*

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4197·730	2	4185·887	3	4174·096	4
97·587	1	85·747	2	73·933	1
97·461	2	85·632	1	73·702	2
97·297	3	85·479	3	73·546	1
97·075	8	85·379	3	73·357	2
96·815	8	85·245	6	73·040	1
96·581	4	84·882	3	72·781	4
96·392	1	84·728	8	72·530	6
96·227	4	84·461	1	72·318	3
96·072	6	84·390	1	72·085	1
95·616	8	84·270	2b	71·918	3
95·347	4	83·846	3	71·755	4
94·968	1	83·713	4	71·549	2
94·862	1	83·478	4	71·337	2
94·697	3	83·330	6	70·955	6
94·482	4		1	70·662	3
94·308	3	83·031	5	70·364	8
94·194	1	82·807	2	70·242	3
94·021	1	82·619	3	69·932	5
93·865	4	82·364	2	69·771	1
93·720	4	82·132	3	69·567	6
93·494	2	81·974	2	69·193	3b
93·274	3	81·761	3s	68·973	3
93·128	1	81·583	2	68·801	4
93·032	1	81·370	5	68·608	1
92·847	3	81·188	2	68·377	1
92·596	4	81·048	2	68·221	6
92·313	4	80·795	4b	67·832	5
92·135	3	80·648	1	67·700	1
91·946	2	80·540	1	67·522	4
91·660	5	80·355	1	67·316	3
91·347	4	80·198	3	67·028	5
91·211	1	79·951	8	66·890	3
90·980	5	79·657	4	66·658	4
90·802	1	79·376	8	66·485	3
90·730	1	78·856	3	66·323	2
90·319	3b	78·696	5	66·200	4
90·131	3	78·322	4	65·916	2
89·907	6	78·184	1	65·683	4
89·716	1	78·102	1	65·473	5
89·552	5	78·031	1	65·270	4
89·283	4	77·718	4	65·146	4
89·039	3	77·536	3	64·956	1
88·816	4	77·389	2	64·807	1
88·614	2b	77·264	1	64·611	3
88·290	5	76·995	2	64·416	3
88·079	2	76·837	6	64·247	6
87·787	5	76·505	3	64·094	4
87·622	5	76·348	6	63·755	4
87·422	3	75·982	3	63·532	4
87·259	1	75·756	6b	63·285	6
87·197	4	75·492	2	62·941	4
86·936	1	75·413	1	62·729	3
86·839	4	75·293	1	62·638	3
86·637	3	75·119	4	62·442	1
86·438	2	74·759	4	62·332	5
86·296	4	74·580	5	61·971	1
86·075	4	74·312	4b	61·858	5



BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4161·682	1	4150·009	1	4136·701	2
61·572	4	49·890	4n	36·535	3
61·308	1	49·734	3	36·202	3
61·173	4	49·498	1	36·016	2b
60·971	3	49·406	1		
60·880	3	49·205	1	35·854	1
60·734	1	49·042	2	35·672	3
60·559	2	48·905	3	35·175	3
60·377	1	48·595	5	34·987	3
60·199	3	48·227	6	34·755	1
60·034	4	48·051	1	34·570	2
59·781	1	47·897	3	34·359	4
59·670	3	47·671	6n	34·060	2
59·576	3	47·525	6n	33·852	1
59·476	3	47·173	1	33·701	2
59·365	1	47·025	3	33·511	2
59·039	6	46·862	3	33·359	1
58·764	3	46·640	2b	33·268	1
58·631	4	46·469	1	32·923	1
58·223	3	46·311	2	32·714	2n
58·129	3	46·099	3	32·432	3
57·887	4	45·890	1	31·964	3b
57·566	8	45·642	5	31·717	1
57·173	2	45·323	1	31·575	2
56·922	6	45·176	1	31·343	3
56·651	1	45·038	2	31·131	3
56·485	1	44·733	2	30·785	1
56·240	3	44·310	4	30·684	1
56·126	3	43·507	1	30·555	1
55·951	1	43·179	1	30·427	1
55·756	4	43·001	3	30·280	1
55·569	3	42·784	3	30·112	1
55·272	1	42·796	2	29·894	1
55·164	4	42·672	2	29·653	1
55·034	2n	42·397	4b	29·387	3
54·747	2	42·046	2	29·148	1
54·672	3	41·787	3	28·915	2b
54·362	5	41·583	2	28·666	1
53·979	5	41·317	4b	28·539	1
53·709	1	41·138	1	28·406	1
53·497	5	40·911	1	28·262	4
53·168	3	40·701	4	27·939	1
53·009	1	40·389	4	27·795	3
52·818	2	40·017	3	27·472	1
52·640	3	39·836	3	27·274	2
52·391	3	39·596	2	27·120	1
52·215	3	39·435	2	26·994	1
52·105	3	39·224	2	26·806	2
51·886	3	38·969	3	26·604	1
51·622	4	38·842	4	26·402	1
51·410	3	38·249	1	26·205	1
51·185	1	38·019	2	26·057	1
51·011	2	37·829	1	25·830	2
50·881	2	37·709	1	25·459	3
50·758	1	37·469	5	25·065	3
50·589	3	37·055	1	24·859	2
50·493	3	36·928	2	24·694	2
50·285	4	36·856	1	24·443	2

BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4124.243	3b	4111.037	1	4098.349	5
24.071	1	10.774	4	98.048	3n
23.949	2	10.537	3	97.704	6
23.789	1	10.368	3	97.443	1
23.582	1	10.058	6b	97.262	2
23.457	4	09.722	2	97.095	3
23.298	1			96.905	4
23.109	1	09.109	3	96.634	1
22.863	2	08.839	3	96.433	4
22.721	2	08.514	2	96.095	4
22.565	1	08.322	2	95.972	4
22.146	4	08.026	2	95.728	3
21.881	1	07.801	4	95.332	3
21.541	1	07.595	1	95.184	4
21.352	1	07.493	1	94.941	1
21.098	3b	07.283	3	94.868	1
20.735	3	06.785	8	94.660	4
20.534	2	06.291	2n	94.475	1
20.340	4	06.066	1	94.369	4
20.176	1	05.929	2	93.928	4
20.051	1	05.684	1	93.724	1
19.759	1	05.572	2	93.477	4
19.624	1	05.375	2	93.265	4
19.371	2	05.133	2	93.189	4
18.950	2	05.032	2	92.971	2
18.862	3	04.868	1	92.799	3
18.445	1	04.729	2	92.678	3
18.311	2	04.607	1	92.430	1
18.059	3	04.488	2	92.242	2
17.852	4	04.351	2	91.974	4
17.587	3	04.166	3	91.768	4
17.423	3	03.958	1	91.418	4
17.107	4	03.694	4	91.229	1
16.874	1	03.407	4	91.059	3
16.731	3	03.140	2	90.589	4
16.408	2b	02.973	2	90.493	4
16.084	3	02.755	1	90.302	3
15.760	4	02.585	4	89.954	2b
15.529	3	02.410	1	89.677	2
15.170	3	02.261	1	89.442	1
14.983	1	02.086	3	89.283	3
14.743	2	01.892	1	39.127	4
14.435	3	01.711	3	88.879	3
14.086	6b	01.390	3	88.611	4
13.730	3b	01.199	4	88.355	1
13.448	4	01.000	1	88.205	2
13.208	4	00.743	4	88.092	3
13.031	1	00.484	1	87.807	8
12.895	1	00.264	2	87.547	5
12.640	4	00.063	3	87.333	1
12.411	2	4099.893	1	87.175	4
12.277	1	99.649	1	86.914	4
12.132	1	99.479	3	86.734	4
11.953	2	99.403	3	86.490	4
11.791	3	99.214	3	86.359	4
11.635	3	98.985	4	86.134	3
11.449	1	98.724	4	85.909	2
11.231	3b	98.526	1	85.714	4

BAND SPECTRUM OF SULPHUR—*continued.*

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4085·445 }	8 }	4073·720 }	1	4060·956 }	3
85·193 }	8 } b	73·471 }	3	60·801 }	2
84·950 }	1	73·224 }	1	60·624 }	3
84·820 }	2	73·082 }	3	60·343 }	5
84·654 }	2	72·976 }	1	60·226 }	3
84·356 }	8	72·816 }	3	60·099 }	1
84·103 }	3	72·646 }	3	59·962 }	1
83·921 }	1	72·538 }	3	59·787 }	6
83·810 }	3	72·319 }	2	59·623 }	2
83·590 }	5	72·181 }	2	59·496 }	2
83·264 }	5	72·082 }	1	59·417 }	2
83·115 }	3	71·668 }	4	59·128 }	3
82·873 }	5	71·522 }	1	58·996 }	2
82·581 }	5	71·370 }	3	58·855 }	3
82·298 }	4	71·198 }	4	58·709 }	4
82·180 }	4	70·965 }	4	58·553 }	5
81·999 }	4	70·808 }	3	58·239 }	5
81·833 }	2b	70·582 }	4	58·069 }	1
81·577 }	5	70·269 }	5	57·923 }	1
81·384 }	1	70·039 }	1	57·865 }	1
81·193 }	5	69·950 }	1	57·644 }	5
80·977 }	5	69·722 }	5	57·397 }	3
80·786 }	3	69·399 }	4	57·123 }	2
80·539 }	6	69·062 }	5	56·958 }	5
80·157 }	6	68·688 }	2	56·708 }	3
79·841 }	2	68·432 }	5	56·454 }	4
79·648 }	1	68·015 }	5b	56·331 }	1
79·506 }	2	67·810 }	2	56·046 }	1
79·375 }	3	67·675 }	1	55·883 }	8
79·197 }	4	67·529 }	3	55·676 }	3
78·950 }	4	67·355 }	3	55·580 }	2
78·870 }	4	67·132 }	5	55·325 }	5
78·621 }	3	66·838 }	5b	55·159 }	3
78·442 }	3	66·593 }	5b	54·999 }	2
78·246 }	2b	66·279 }	2	54·794 }	4
78·084 }	3	66·009 }	2	54·609 }	3
77·887 }	1	65·893 }	1	54·435 }	3
77·792 }	1	65·521 }	6	54·296 }	3
77·693 }	1	65·447 }	4	54·157 }	2
77·581 }	3	65·259 }	4	53·896 }	4
77·437 }	1	65·060 }	3	53·768 }	4
77·170 }	10	64·916 }	2	53·523 }	3
76·754 }	5	64·733 }	2	53·304 }	6
76·497 }	3	64·524 }	1	53·162 }	3
76·400 }	3	64·372 }	2	52·964 }	3
76·194 }	3	64·201 }	4	52·844 }	3
75·963 }	1	64·067 }	3	52·639 }	4
75·745 }	6	63·373 }	10	52·482 }	4
75·555 }	3	63·181 }	8	52·220 }	4
75·373 }	2	62·933 }	2	52·029 }	4
75·208 }	3	62·757 }	2	51·900 }	1
75·076 }	4	62·514 }	3	51·631 }	5
74·877 }	1	62·286 }	3	51·386 }	8
74·793 }	2	62·197 }	3	51·178 }	8
74·601 }	3	61·961 }	1	50·925 }	4
74·379 }	4	61·727 }	8b	50·807 }	4
74·193 }	4	61·416 }	2	50·584 }	4
73·869 }	1	61·177 }	4	50·432 }	2



BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4050·285	4	4038·085	3	4025·847	2
50·065	4	37·915	1	25·699	1
49·812	4b	37·751	1	25·527	1
49·628	4	37·546	4	25·293	5
49·413	3	37·281	6	25·109	5
49·272	1	37·018	1	24·806	1
49·009	5	36·638	1	24·570	5
48·803	1	36·631	3b	24·303	3
48·605	2			24·120	2
48·341	4	36·125	1	23·928	2
48·016	4	35·989	1	23·776	3
47·842	3b	35·910	1	23·692	3
47·699	3	35·783	3	23·459	2
47·448	3	35·675	3	23·240	3
47·303	2	35·413	1	22·975	3
47·144	2	35·147	4	22·794	2s
46·942	3	34·967	2	22·619	4
46·833	3	34·714	4	22·310	4
46·637	3	34·538	1	22·152	3
46·401	4	34·332	4	21·852	4
46·142	4	34·061	5	21·630	1
45·629	3	33·772	5	21·490	3
45·432	1	33·440	5	21·287	1
45·325	1	33·142	4	21·197	2
45·075	5	32·928	4	20·966	3
44·690	3	32·689	3	20·700	4
44·546	3	32·533	2	20·536	2
44·248	3	32·389	4	20·346	3
44·077	2	32·216	1	20·119	2
43·932	2	32·069	3	20·008	2
43·723	2	31·892	3	19·752	2
43·521	2	31·785	1	19·463	2
43·293	2	31·629	1	19·175	1
43·125	2	31·330	4	18·996	1
42·900	1	31·121	4	18·794	1
42·586	2	30·698	4	18·670	2
42·484	2	30·392	5	18·495	2
42·315	5	30·142	3	18·244	3
42·040	1	30·014	3	18·106	1
41·939	1	29·797	3	17·916	1
41·850	1	29·473	3	17·742	1
41·668	3	29·276	3	17·505	1
41·252	6	29·209	2	17·332	3
41·065	1	29·022	2	17·056	2
40·930	2	28·944	2	16·862	1
40·693	3	28·735	4	16·714	2
40·575	3b	28·394	4	16·416	2
40·560	3	28·292	1	16·295	1
40·290	2	28·033	4	16·145	4
40·004	4	27·904	4	15·689	3
39·802	2	27·702	3	15·460	1
39·521	5	27·552	3	15·376	1
39·331	2	27·434	3	15·104	3n
39·062	4	27·283	3	14·833	1
38·859	4	26·991	5	14·743	1
38·620	3	26·743	5	14·519	3
38·330	3	26·369	5	14·337	1
38·296	4b	26·072	5	14·183	2



BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
4014·024 }	1	4002·112	1	3988·550 }	2
13·600 }	2n	01·959	1	88·322 }	2
13·347 }	2n	01·681	3	87·955 }	2
13·054 }	3	01·493 }	2	87·772 }	1
12·891 }	1	01·347 }	2	87·619 }	2
12·724 }	1	01·107 }	3	87·288 }	3
12·567 }	3	00·955 }	1	87·057 }	1
12·450 }	1	00·635 }	8b	86·891 }	1
12·283 }	1	00·286 }	1	86·749 }	2
12·161 }	1b	00·066 }	2	86·558 }	2
12·041 }	1	3999·835 }	2	86·331 }	2
11·676 }	2	99·733 }	2	86·016 }	2
11·463 }	4	99·637 }	4	85·862 }	3
11·209 }	2	99·432 }	1	85·394 }	4
11·103 }	3	99·243 }	2	85·205 }	4
10·896 }	1	99·125 }	1	84·843 }	3b
10·792 }	2	98·925 }	2		
10·670 }	1	98·721 }	5	84·549 }	1
10·473 }	1	98·545 }	1	84·385 }	1
10·280 }	1	98·340 }	3	84·247 }	4
10·119 }	2	98·026 }	3	84·000 }	2
09·701 }	2	97·868 }	1	83·750 }	2
09·508 }	2	97·699 }	2	83·591 }	1
09·133 }	2	97·376 }	2	83·339 }	2
08·751 }	5	96·778 }	2	83·129 }	1
08·521 }	2	96·506 }	2	82·875 }	4
08·193 }	4	96·314 }	2	82·567 }	4
08·016 }	3	95·851 }	2	82·479 }	2
07·738 }	1	95·722 }	2	82·043 }	3
07·528 }	3	95·535 }	2	81·822 }	3
07·364 }	3	95·339 }	2	81·510 }	4b
07·196 }	1	95·104 }	2	81·275 }	1
07·064 }	1	94·846 }	4	80·976 }	3
06·865 }	3	94·656 }	2	80·743 }	1
06·749 }	3	94·355 }	1	80·388 }	4
06·566 }	2	94·174 }	2	80·176 }	1
06·397 }	3	93·991 }	1	79·946 }	4
06·176 }	3	93·667 }	2	79·553 }	2
05·787 }	2	93·596 }	3	79·374 }	4
05·574 }	2	93·407 }	4	79·234 }	4
05·196 }	1	93·133 }	1	78·909 }	2
05·040 }	4	92·954 }	1	78·624 }	2
04·895 }	2	92·757 }	2	78·106 }	5
04·610 }	1	92·421 }	2	77·693 }	3
04·470 }	2	92·048 }	3	77·384 }	1
04·388 }	2	91·795 }	1	77·117 }	1
04·239 }	1	91·502 }	3	76·941 }	1
04·113 }	1	91·239 }	1	76·758 }	4
03·968 }	2	91·040 }	1	76·483 }	1
03·793 }	2	90·829 }	4	76·323 }	2
03·477 }	2	90·518 }	2	76·163 }	1
03·251 }	3	90·239 }	2	75·930 }	1
03·073 }	1	89·935 }	1	75·834 }	3
02·946 }	1	89·756 }	3	75·711 }	1
02·755 }	1	89·444 }	2	75·460 }	3
02·494 }	4	89·153 }	2	75·192 }	1
02·271 }	3	89·023 }	1	75·007 }	2
02·3'1 }	2	88·764 }	2	74·780 }	3

BAND SPECTRUM OF SULPHUR—*continued.*

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
3974.532	1	3962.508	3	3950.158	4
74.386	1	62.176	5	49.849	3
74.212	1	61.891	1	49.609	3
74.034	3	61.759	2	49.489	2
73.716	2	61.615	3	49.258	4
73.516	1	61.307	2	48.961	4
73.322	2	61.162	1	48.687	4
73.190	1	61.019	2	48.502	4
73.012	3	60.857	1	48.364	4
72.808	3	60.678	2	48.139	1
72.584	1	60.579	1	48.009	2
72.321	3	60.398	4	47.735	4
72.131	2	60.243	1	47.491	1
71.907	1	60.119	3	47.336	2
71.762	3	59.931	2	47.201	4
71.542	2	59.806	1	46.740	1
71.282	3	59.707	1	46.502	4
70.929	4	59.497	2	46.350	3
70.710	2	59.387	1	46.111	4
70.504	3	59.260	1	45.844	3
70.191	1	59.097	4	45.606	3
70.008	4	58.898	1	45.540	3
69.816	2	58.794	2	45.164	4
69.736	1	58.557	2	44.937	1
69.529	1	58.303	5	44.752	1
69.268	1	58.014	1	44.648	4
69.072	1	57.843	3	44.350	3
68.955	3	57.665	4	44.136	2
68.489	3	57.393	2	43.826	1
68.375	1	57.144	4	43.548	4
68.245	1	56.965	3	43.311	4
68.096	1	56.363	3	42.567	4
67.938	2	56.161	1s	42.144	4
67.721	2	55.954	1s	41.641	4
67.548	2	55.700	4	41.304	1
67.280	3b	55.461	1	40.765	2b
67.072	3	55.203	4	40.446	5
66.818	2	54.943	4	40.162	1
66.631	2	54.755	1	39.808	4
66.450	3	54.404	4	39.358	5
66.257	2	54.179	2	38.875	1
66.083	2	54.069	2	38.762	1
65.892	4	53.912	1	38.485	3
65.714	1	53.782	2	38.279	1
65.511	4	53.608	3	38.051	2
65.294	2	53.495	1	37.425	3
65.153	2	53.309	1	37.164	3
64.777	3	53.129	3	36.673	4
64.553	4	52.908	3	36.278	3b
64.385	1	52.647	1	35.878	2
64.248	3	52.308	2	35.460	5
63.937	3s	52.071	2	35.155	3
		51.837	2	34.916	3b
63.602	1	51.500	3	34.535	2
63.435	4	51.206	3	33.932	4
63.481	4	50.978	2	33.685	1
63.077	1	50.673	4	33.249	2b
62.789	3	50.329	4	32.432	5b

BAND SPECTRUM OF SULPHUR—*continued.*

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
3931·947	2	3911·050	3	3889·050	2b
31·712	3	10·911	2	88·524	2b
31·416	1	10·624	1	88·121	2
31·078	1	09·914	4	87·647	3
30·874	1	09·148	1	86·839	3
30·559	2	08·846	4	86·036	2b
30·237	1	08·570	3	85·750	5
30·106	2	08·343	3	85·399	3
29·691	3	07·531	3	85·183	2
29·461	1	07·127	4	84·873	2
28·856	4b	06·841	1	84·584	1
28·403	2	06·634	1	84·332	3
27·573	2	06·285	4	84·065	2
27·274	2	05·702	3	83·828	1
26·953	4	05·497	3	83·214	3
26·354	1	05·126	4	82·697	3
26·111	3	04·684	1	82·429	5
25·837	2	04·477	3	82·172	1
25·272	2	04·157	6	81·919	2
25·042	2	03·819	1	81·433	6
24·802	2	03·298	1	81·016	2
24·415	2	02·827	1	80·518	1
24·178	2	02·362	4b	80·306	1
23·903	1	01·842	1	80·123	1
23·733	3	01·622	1	79·860	2
23·288	1	01·432	4	79·635	2
22·813	1	00·762	5	79·325	5
22·114	5	00·437	3	78·660	3
21·580	1	00·181	3	77·925	1
21·363	1n	3899·753	6	77·365	4b
21·013	1	99·244	2	76·982	2
20·887	2n	98·864	3	76·560	2
20·456	4	98·606	2	76·103	2
20·047	4	98·248	1	75·707	2
19·577	5	98·023	1	75·378	2
19·022	3	97·724	3	74·587	1
18·760	2	97·310	1	74·091	4
18·369	3n	97·021	2b	73·670	2b
18·198	1n			73·249	2
17·904	1	96·527	2	72·888	1
17·542	2n	96·109	3	72·316	1
17·389	1n	95·574	2	72·064	2
17·046	2	95·165	2b	71·761	1n
17·834	1			71·115	3
16·527	3b	94·601	3	70·816	1n
15·966	2b	94·202	3	70·501	3
15·322	3	93·743	1	70·275	2
14·906	2b	93·566	1	69·951	1
14·683	2b	93·323	3	69·766	1n
14·337	1b	93·097	1	69·156	1n
13·944	2b	92·815	1	69·037	3
13·406	4	92·565	2	68·645	4
13·153	2	91·715	2	68·104	3
12·771	1	91·434	1	67·509	3
12·546	2	91·230	1	66·917	3
12·212	4	90·984	3s	66·415	4b
11·920	1	90·460	3	65·486	1s
11·661	5	90·104	2	65·219	2b
11·408	1	89·786	2	64·849	2



BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
3864.566 }	2	3840.021	3s	3814.984 }	1b
64.233	1	39.702	1n	14.573	1b
63.859	2	39.174	2	14.074	1
63.143	4	38.868	1	13.896	1
62.480	2b	38.366	2	13.542	3
62.091	5	38.253	2	12.881	4
61.490 }	2	37.914 }	1n	12.467	1
61.218	2	37.396	2b	12.337	1
60.858	2			12.041	3
60.516 }	3	37.017	3s	11.645	2
59.787	5s	36.758	1	11.330	4
59.102	2	36.530	2	10.704	3b
58.366	2b	36.088	3		
57.750	4	35.668 }	2	09.851	2
57.457	2	35.506 }	2n		
		35.204	1	09.274	3
56.312	1	34.901	3	08.880	3
56.017 }	2	34.157	1s	08.592	1
55.810 }	3	33.798	1n	08.377	1
55.428	3	33.505	2b	07.748	2
54.822	1	33.096	1	07.365	3
54.599 }	1	32.883	1	07.017	2
54.281 }	1	32.630	1	06.694 }	2
54.100	3	32.407	1	06.414 }	2b
53.686 }	3	32.135	1	05.821 }	2b
53.392	2b	31.884	2	05.186	3
53.145	1	31.497	1b	04.844	3
52.917 }	3	30.975	2	04.423	1
52.590 }	2	30.569 }	1	04.136	1
52.300 }	3	30.269 }	2	03.676 }	2
51.874 }	3b	29.398	1b	03.429 }	3
		29.073	1b	03.073	2
51.752	1	28.484	2b	02.421	3
51.271 }	3	27.437	1	01.903 }	1
51.004 }	2	27.152	1	01.645 }	3
50.664	1b	26.831	3	01.199	2
50.395	2	25.412	1	00.716	2b
49.499	4	25.174	2b	00.252	1b
49.183	1	24.563	4	3799.893	2b
48.878	3b	23.727 }	2	99.059	2
48.011	2b	23.537 }	2n	98.354	2
		22.964	3	97.559	1b
47.666	1	22.200	2	97.203	1
47.259	2	21.947	1	96.889	2
46.291	3	21.481	1	96.362	1
46.023	2	21.090	1	96.128	2
45.770	2	20.881	1	95.716	2
45.300	3b	20.188	1	95.390	1
44.988 }	1	19.881	1	94.618	3
44.718 }	3	19.559	1	94.176 }	1
44.390	1	19.201	2	93.914 }	2
44.095	4	18.954 }	2	93.564 }	1
43.471	2	18.528 }	1	93.300	2
43.250	2	18.323 }	1	92.841	4
42.689 }	1	17.796	3	92.451	1
42.538 }	2	16.986	3	92.072	3
42.277	1	16.626	2s	91.713	4
41.911	3b	15.569	2	91.400	2
40.905	4	15.168 }	3b	91.055	1



BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
3790·860	2	3769·651	3	3748·054	4
90·554	3	69·472	6	47·456	4
89·972	3	69·215	1	46·998	6
89·670	4	68·996	2	46·047	3
89·386	2b	68·583	2	45·429	2
89·096	1	68·233	3	44·749	2b
88·880	3	67·526	3	44·500	1
88·476	3	66·921	3	44·186	2b
88·202	1	66·670	2	43·782	2
87·843	1	66·358	2	43·432	2
87·466	2	65·884	3b	42·977	2
87·159	3	65·723	2	42·489	3
86·839	2	65·476	2	41·999	3
86·639	3	65·029	4b	41·515	3
86·143	1	64·717	1	41·217	2
85·818	4b	64·321	2	40·858	3
85·321	4	63·736	2	40·099	3
85·117	3	63·546	1	39·885	1
84·668	1	63·032	2b	39·617	2
84·454	1			39·157	2
83·946	2	62·667	2	38·941	2
83·577	1			38·667	2
83·342	1b			38·453	2
83·085	2	61·920	3	38·120	2
82·519	2	61·646	3	37·968	2
82·030	1b	61·249	3b	37·373	3
81·779	1	60·966	1b	36·744	3
81·511	1	60·751	3	36·080	1
81·280	3	60·505	2	35·449	2
80·451	1	60·194	3	35·014	2
80·163	3	60·006	3	34·712	2
79·902	1	59·748	2	34·253	3
79·605	3	59·426	1	33·794	2
79·454	3	59·211	1	33·128	2
78·743	2	58·871	4b	32·782	1
78·447	2	58·099	1	32·538	2
78·103	2	57·815	1b	32·033	3
77·818	1	57·502	1	31·756	1
77·367	2b	57·202	4s	31·573	1
77·028	1	56·768	2	30·971	2
76·582	4	56·280	3b	30·661	4
76·307	1	55·941	1	30·067	2
75·542	2	55·542	4	29·845	1
75·262	2	55·115	1	29·611	1
74·795	3	54·854	2	29·293	3
74·240	2b	54·567	1	29·068	1
73·983	1	54·026	4	28·533	4b
73·655	1	53·722	3		
73·361	3	53·385	3	28·089	1
72·913	3r	52·473	4	27·819	2
72·422	2	51·911	3	27·314	2
72·085	2	51·262	3	27·051	1
71·717	2	50·873	4	26·613	3
71·311	1n	50·498	1	26·079	2
70·777	3	50·175	5	25·888	1n
70·524	2	49·536	2	25·348	1
70·273	1n	49·284	3	25·100	2
		49·023	1	24·785	2
69·768	3	48·731	6	24·569	1

BAND SPECTRUM OF SULPHUR—*continued*.

Wave-length	Intensity and Character	Wave-length	Intensity and Character	Wave-length	Intensity and Character
3724·345 }	2	3694·703 }	1b	3667·340 }	2
23·368 }	2n	94·643 }	1b	67·067 }	1
22·999 }	2s	94·138 }	3b	66·899 }	1
22·089 }	2b	93·790 }	1b	66·537 }	2
21·691 }	3	93·499 }	1b	66·217 }	4
21·043 }	1	93·086 }	2n	66·130 }	1
20·500 }	1	92·642 }	3n	65·695 }	1
19·438 }	1n	91·836 }	3n	65·285 }	2
19·149 }	1s	91·400 }	1n	64·990 }	2
18·847 }	3	91·095 }	2	64·689 }	2
18·518 }	2	90·872 }	2	64·418 }	2
18·246 }	1	90·552 }	1	64·080 }	2
17·178 }	2	90·267 }	2	63·756 }	2
16·565 }	2	90·059 }	2	63·473 }	2
15·885 }	2	89·610 }	2b	63·345 }	1
15·448 }	2	89·208 }	2n	62·877 }	1b
15·137 }	1	87·010 }	1n	62·656 }	2s
14·755 }	3b	86·585 }	1n	62·437 }	3n
14·484 }	2	86·134 }	2	62·276 }	2
13·807 }	2	85·779 }	1	61·614 }	1
13·551 }	3	85·457 }	1	61·307 }	1
12·747 }	2	84·943 }	2	61·023 }	1
12·417 }	2n	84·518 }	3	60·478 }	2s
11·967 }	2	83·896 }	1	60·253 }	2s
11·404 }	3	83·595 }	1	60·019 }	1b
11·112 }	1	83·225 }	2	59·656 }	2
10·818 }	2	82·547 }	1n	59·075 }	3
10·573 }	1	81·632 }	1n	59·706 }	2
10·322 }	2	81·203 }	2n	58·508 }	1
09·716 }	4	80·939 }	1n	58·295 }	2s
08·924 }	2	80·255 }	1	57·991 }	3
08·177 }	1	79·302 }	2	57·547 }	2
07·622 }	2	78·997 }	3	57·068 }	2
07·442 }	1	78·446 }	1	56·852 }	1s
06·786 }	1	77·806 }	1	56·573 }	3
06·590 }	1n	77·405 }	1s	56·159 }	2b
06·177 }	1n	77·073 }	2	55·754 }	3b
05·306 }	2s	76·826 }	1	55·220 }	5b
04·444 }	1	76·271 }	2	54·842 }	4
03·870 }	2	75·874 }	1	54·334 }	2
03·220 }	1	75·644 }	2	54·105 }	2
02·513 }	2	75·233 }	3	53·838 }	2
02·361 }	2	74·055 }	3	53·602 }	2
02·022 }	1b	73·517 }	2	53·300 }	2n
00·696 }	2	73·042 }	2	53·096 }	2n
3699·907 }	1	72·717 }	1n	52·834 }	1
99·604 }	3	72·377 }	2	52·536 }	1
99·038 }	1	71·894 }	2	52·274 }	1
98·779 }	2	71·632 }	2	52·074 }	2
98·553 }	1	71·185 }	1s	51·583 }	3
98·147 }	2s	70·762 }	3n	51·200 }	1
97·491 }	2s	70·333 }	3	50·537 }	5
96·955 }	2	70·153 }	1	50·084 }	2
96·264 }	2	69·197 }	3	49·325 }	1b
96·040 }	1	68·701 }	1n	49·067 }	4
95·450 }	2	68·466 }	1	48·838 }	3
95·235 }	3n	67·951 }	3	48·516 }	2
94·976 }	2	67·634 }	2n		

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# APPENDIX Q.

## NEON.

Baly, 'Phil. Trans.' (A) ccc. p. 183, 1903.

Wave-length	Intensity and Character	Living and Dewar	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda}$	
6717.20	1	6716	1.82	4.0	14883.2
6599.16	4	6601	1.79	4.1	15149.3
33.10	4	6535	1.78	"	15302.6
06.72	6	6508	1.77	4.2	64.5
6444.90	1	6446	1.75	"	15501.9
09.90	1		1.74	"	96.7
02.40	10	6404	"	"	15604.9
01.26	1		"	"	17.7
6383.15	8	6382	"	"	62.2
52.04	1		1.73	4.3	15738.7
31.13	1		1.72	"	90.7
28.38	6	6334	"	"	97.5
13.94	1		"	"	15833.7
04.99	8	6304	1.71	"	56.1
6294.04	1		"	"	83.7
73.26	1		"	"	15936.4
66.66	10	6266	1.70	"	53.5
59.06	1		"	"	72.5
47.00	1	? 6244	"	4.4	16003.3
17.50	8	6217	1.69	"	79.2
14.13	2		"	"	88.0
06.01	1		"	"	16109.0
6199.34	1		"	"	26.3
89.30	1		1.68	"	52.5
82.37	10	6183	"	"	70.6
79.90	1		"	"	77.1
75.15	2	6176	"	"	89.8
73.02	1		"	"	95.1
66.81	1		"	"	16211.4
63.79	10	6163	"	"	19.4
57.12	1		"	"	37.0
50.49	1		1.67	"	54.5
43.28	10	6144	"	"	73.5
28.63	8	6128	"	"	16302.5
18.22	2		"	"	40.2
6096.37	10	6097	1.66	"	98.7
74.52	10	6075	1.65	4.5	16457.7
64.36	1		"	"	85.3



## NEON—continued.

Wave-length	Intensity and Character	Living and Dewar	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
6046.06	1		1.65	4.5	16535.2
43.24	1		"	"	42.9
32.32	2		1.64	"	72.9
30.20	10	6031	"	"	78.7
26.03	1		"	"	90.2
24.40	1		"	"	94.7
01.00	1	6001	1.63	"	16659.4
5991.72	2	5991	"	"	85.2
88.00	4	5987	"	"	95.6
84.94	1		"	"	16704.1
75.78	8		"	"	29.7
74.73	6	5976	"	"	32.7
65.50	4	5964	1.62	"	58.5
61.64	1		"	4.6	69.3
49.51	1		"	"	16803.5
44.91	10	5945	"	"	26.5
39.44	1		"	"	32.0
19.08	1	5919	1.61	"	89.9
13.82	1	5914	"	"	16904.9
06.54	2	5905	"	"	25.8
02.57	4		"	"	37.2
5882.04	8	5882	1.60	"	96.3
73.04	1		"	"	17022.3
* 52.65	20	5852.7	1.59	"	81.7
20.29	4	5820	"	"	17176.7
04.57	1	5804	1.58	4.7	17223.1
5764.54	8		1.57	"	42.7
64.20	1	5763	"	"	43.8
60.72	1		"	"	54.2
48.44	4	5747	"	"	91.3
19.42	1	5718	1.56	4.8	17479.4
5689.96	2	5689	1.55	"	17570.0
02.76	1	5662	1.54	"	17654.4
56.80	4	5656	"	"	73.0
52.67	1		"	"	85.9
5562.96	2	5561	1.52	4.9	17971.1
5433.86	1	5432	1.48	"	18398.2
00.77	4		1.47	5.1	18510.8
00.50	4	5400 (a pair)	"	"	11.7
5343.41	1		1.46	"	18689.5
41.25	4	5341 (a pair)	"	"	18717.1
32.33	4	5330	1.44	"	48.4
5278.50	1		"	5.2	18899.6
71.50	1		"	"	18964.7
18.30	1		1.43	"	68.1
04.12	1	5204	1.42	5.3	19210.2
5188.79	1	5188	"	"	67.0
45.15	1	5145	1.41	"	19434.5
16.72	1	5116	1.40	5.4	19538.3
5880.54	1	5080	1.39	"	19677.5
37.95	1	5038 (strong line)	1.38	"	19843.9
4837.54	1	4838	1.32	5.7	20666.0
06.24	1		"	"	20800.6

\* Extraordinarily brilliant.

## NEON—continued.

Wave-length	Intensity and Character	Livinge and Dewar	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
4789.07	1	4791	1.31	5.7	20875.3
52.88	1	4754	1.30	5.8	21034.4
15.49	4	4715	1.29	"	21200.9
13.51	2		"	"	09.8
12.23	2		"	"	15.6
10.21	2		"	"	24.7
09.00	4	4710	"	"	30.1
04.56	4	4704	"	5.9	51.2
4540.48	1	4540	1.24	"	22018.8
37.39	1	4538	"	6.1	33.0
10.86	1		"	"	22162.2
4459.68	1	4460	1.22	6.2	22416.9
31.14	1	4431	"	6.3	22561.3
30.33	1	4429	1.21	"	65.6
26.15	2		"	"	87.7
25.57	1		"	"	90.7
24.98	2	4424	"	"	93.7
22.69	2	4422	"	"	22604.4
14.44	1	4413	"	"	46.6
4259.53	6	4258	1.17	6.5	23470.3
01.03	4		1.15	6.6	23797.1
4198.71	4	4198	"	"	23810.2
91.44	2		"	"	51.5
90.86	2		"	"	54.8
82.00	2		"	"	23906.4
58.68	4		1.14	"	39.5
3899.21	1	3900	1.08	7.3	25638.9
86.26	1		1.07	"	25724.4
79.49	1		"	"	69.3
3754.31	2	3754	1.04	7.5	26628.5
01.30	6	3701	1.03	7.6	27009.9
3685.84	4	3686	1.02	"	23.2
82.33	4	3683	"	7.7	49.0
33.78	6	3634	1.01	7.8	27511.7
09.27	2	3609	1.00	"	27698.6
06.61	1		"	"	27719.0
00.24	4	3600	"	"	68.1
3593.67	10	3593	"	7.9	27818.8
88.60	1		"	"	58.1
87.52	1	3587.5 (a pair)	"	"	66.5
87.24	1		"	"	68.7
86.62	1		"	"	73.5
67.73	1		0.99	"	28021.1
54.39	1		"	"	26.4
32.30	1		0.98	8.0	28301.9
29.95	1		"	"	21.0
22.92	1		"	"	77.5
20.57	8	3521	"	"	96.5
15.30	6	3515	"	"	28439.1
10.87	2	3510	"	"	75.0
01.34	6	3500	"	8.1	28552.4
3498.19	6	3498	0.97	"	78.1
81.94	1	3481	"	"	28711.5
72.70	8	3473	"	"	87.9
66.72	6	3467	"	"	28837.6

## NEON—continued.

Wave-length	Intensity and Character	Liveing and Dewar	Reduction to Vacuum		Oscillation Frequency in Vacuo
			$\lambda +$	$\frac{1}{\lambda} -$	
3464.48	6	3464	0.97	8.2	28856.2
60.67	6	3460	"	"	88.0
54.30	6	3454	0.96	"	28941.2
50.87	4	3451	"	"	70.3
47.83	8	3447.7 ? He	"	"	75.5
38.66	1		"	"	29072.9
24.05	2	3424	"	8.3	96.8
18.05	8	3418	"	"	29248.2
3375.72	1	3374 ?	0.94	8.4	29514.9
70.01	6	3370	"	"	29665.0
3148.76	1		0.89	8.5	31750.1
26.33	1		0.88	8.9	31977.5
3092.84	1		0.87	"	32323.8
80.05	1		"	"	32457.1
77.08	1		"	"	88.4
57.50	1		0.86	"	32696.6

## FIRST KRYPTON SPECTRUM, WITHOUT LEYDEN JAR AND SPARK GAP.

\*\* The figures in parentheses indicate the intensities.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
6456.65	1	6458 (1)		1.76	4.2	15483.7
6421.32	1	6420 (4)		1.75	"	15568.9
6236.61	1			1.70	4.3	16030.0
6223.00	1			1.69	"	39.3
6083.08	1	6082 (1)		1.66	4.5	16434.5
75.50	1			1.65	"	54.0
56.32	2	6056 (2)		"	"	16507.2
12.34	1	6011 (2)		1.64	"	16628.0
5994.02	2	5992 (3)		1.63	"	78.8
5880.06	1			1.60	4.6	17002.1
* 71.12	10	5871 (10)	5871.071 (8)	"	"	27.9
66.94	1			"	"	40.1
32.94	1			1.59	4.7	17139.3
27.28	1			"	"	56.0
5756.96	1			1.57	"	17365.6
18.59	1			1.56	4.8	17482.0
01.06	2			1.55	"	17535.8
5695.58	1			"	"	52.7
60.37	3			1.54	"	17661.9
49.85	1			"	"	94.8
*5580.64	1			1.52	4.9	17914.2
†* 70.50	10	5571 (10)	5570.417 (8)	"	"	46.8
†* 62.45	6	5563 (3)	5562.363	"	"	72.8

\* Visible in the second Krypton spectrum.

† Probably the green aurora line.

‡ Cf. Xenon.

## FIRST KRYPTON SPECTRUM—continued.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda}$	
*5520·74	1			1·51	4·9	18108·6
19·61	4			"	"	12·3
00·90	1			1·50	5·0	73·8
5498·24	3			"	"	82·6
91·11	1			"	"	18206·3
5475·49	2			1·49	"	58·2
23·44	1	? 5424 (1)		1·48	"	18433·5
4829·90	3			1·32	5·7	20698·7
07·22	4			"	"	20796·3
4792·80	1			1·31	"	20858·9
34·32	4			1·30	5·8	21116·6
4697·17	4			1·29	5·9	21283·6
91·12	2			1·28	"	21311·0
71·40	10		4671·42 (2)	"	"	21401·9
24·48	10		4624·46 (1)	1·27	6·0	21618·0
12·07	1			1·26	"	76·2
4582·90	4	4583 (4)		"	"	21814·2
24·82	4			1·24	6·1	22094·2
* 02·56	9	? 4505 (2)	4502·43 (4)	1·23	"	22203·5
01·13	7			"	"	10·5
*4463·88	10	4464 (3)	4463·82 (5)	1·22	6·2	22395·8
* 54·12	10	4454 (1)	4454·07 (4)	"	"	22438·9
25·32	1			1·21	6·3	22590·9
18·89	1			"	"	22623·8
10·49	1			"	"	66·9
00·11	6	4400 (1)	4400·05 (1)	"	"	22720·4
4385·87	1			1·20	"	94·1
84·01	1			"	"	22803·9
* 76·33	10	4376 (3)	4376·24 (3)	"	"	43·9
64·58	1			"	6·4	22905·3
* 62·83	9	4363 (2)	4362·76 (2)	"	"	14·5
58·43	1			"	"	37·6
* 55·67	1	4356 (12)	4355·62 (5)	1·19	"	52·2
51·48	3			"	"	74·3
* 19·76	10	4320 (8)	4319·760 (4)	"	"	23143·2
* 18·74	8	4319 (3)	4318·70 (2)	1·18	"	48·5
* 00·67	1	4301 (7)		"	6·5	23245·7
4286·64	1			"	"	23321·8
* 83·17	4	4283 (3)		"	"	40·7
74·15	10	4274 (4)	4274·09 (4)	1·17	"	90·0
4046·60	1			1·11	7·0	24705·1
3800·71	2			1·05	7·4	26303·5
3797·05	1			"	"	28·8
73·59	3			1·04	"	26492·6
3679·58	4			1·02	7·7	27169·3
* 68·74	2			"	"	27249·6
65·43	3			"	"	74·2
50·21	2			1·01	"	27388·0
15·57	2			"	7·8	27650·4
3522·79	1			0·98	8·0	28378·6
02·69	2			"	8·1	28541·4

\* Visible in the second Krypton spectrum.



## SECOND KRYPTON SPECTRUM, WITH LEYDEN JAR AND SPARK GAP.

\* \* The figures in parentheses indicate the intensities.

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
†5871·12	1	5871 (10)		1·60	4·6	17027·9
5771·60	1	5771 (2)		1·57	4·7	17321·5
53·19	1	5753 (2)		"	"	77·0
5690·56	3	5690 (5)		1·55	4·8	17568·2
82·15	5	5682 (5)		"	"	94·2
74·70	1			"	"	17617·3
72·94	1			"	"	22·6
50·56	1 }	5650 (1)	{	1·54	"	92·6
49·76	1 }			"	"	95·1
33·17	6	5632 (2)		"	"	17747·2
5597·47	1			1·53	4·9	17860·3
† 80·64	1			1·52	"	17914·2
† 70·50	3	5571 (10)	5570·417	"	"	46·8
68·84	2			"	"	52·2
†† 62·45	2	5563 (3)	5562·363	"	"	72·8
53·15	1n	5553 (1)		"	"	18002·9
		5544 (not seen)				
23·75	1 }	5523 (2)		1·51	"	99·1
23·13	2 }			"	"	18100·8
† 20·74	1			"	"	08·6
		5506 (not seen)				
5499·73	1	5500 (2)		1·50	5·0	77·7
		5483 (not seen)				
68·31	2n			1·49	"	82·2
46·51	2	5446 (2)		"	"	18355·4
38·84	1	{ 5429 (not seen)	{	1·48	"	81·3
18·55	1	{ 5424 (seen)		"	"	18450·1
		5403 (not seen)				
5333·55	2			1·46	5·1	18744·1
23·15	1			1·45	"	80·8
17·56	1	5319 (1)		"	"	18800·6
08·84	1	5305 (not seen)	5208·57 (1)	"	"	31·4
5276·69	1	5278 (1)		1·44	"	18946·2
29·67	1	5229 (1)		1·43	5·2	19116·5
24·72	1			"	"	34·3
17·59	1	5218 (1)		"	"	60·7
		5215 (not seen)				
08·50	3	5209 (5)	5208·57	1·42	5·3	94·1
00·36	1	5203 (1)		"	"	19224·1
5187·17	1	5186 (1)		"	"	73·0
68·33	1	5172 (not seen)		1·41	"	19343·3
66·95	1	5166 (5)		"	"	48·5

† First Krypton spectrum.

‡ Cf. Xenon II. 5562·46 (2).

SECOND KRYPTON SPECTRUM—*continued*.

Wave-length	Intensity and Character	Livinge and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
‡5143·25	1	5143 (4)		1·41	5·3	19437·7
25·88	2	5126 (6)		1·40	"	19507·4
23·35	1			"	"	13·2
5086·67	1	5087 (3)		1·39	5·4	19653·8
77·37	1	5078 (1)		"	"	89·8
72·71	1	5073 (2)		"	"	19707·9
65·74	1			"	"	35·1
54·61	1	5057 (not seen)		1·38	"	78·5
46·51	1			"	"	19810·3
33·95	1	5034 (1)		"	"	59·7
28·48	1			"	5·5	81·2
22·57	2	5023 (4)		1·37	"	19904·6
22·01	1			"	"	06·8
16·58	1			"	"	28·4
13·42	3	5014 (2)		"	"	41·0
09·49	1			"	"	56·6
4982·95	1			1·36	"	20062·9
79·00	3	4980 (1)		"	"	78·8
60·44	1	4960 (1)		"	"	20154·0
48·67	1			1·35	"	97·9
45·75	2	4946 (1)		"	"	20213·9
33·32	1			"	5·6	64·7
16·11	1	4903 (not seen)		1·34	"	20335·7
4889·16	1			"	"	20447·8
70·23	1			1·33	"	20527·3
† 57·36	1			"	5·7	81·6
46·76	4n	4847 (2)		"	"	20626·6
45·79	1	4845 (2)		"	"	30·8
36·75	2			1·32	"	69·3
33·89	1			"	"	81·6
32·26	4n	4833 (5)	4832·22 (2)	"	"	88·5
26·21	1			"	"	20714·5
25·37	3n	4826 (3)	4825·38 (1)	"	"	18·1
11·91	4	4812 (3)		"	"	76·1
03·16	< 1			1·31	"	20813·9
4796·48	2n			"	"	42·9
89·89	1			"	"	71·6
88·93	< 1			"	"	76·8
78·57	1n			"	"	20921·0
73·16	2			"	5·8	44·7
65·90	6	4766 (10)		1·30	"	76·6
62·60	5	4763 (3)	4762·66 (2)	"	"	91·1
54·63	2			"	"	21026·3
52·14	3n			"	"	37·3
39·16	7	4739 (10)	4739·13 (5)	"	"	95·0
29·88	1			1·29	"	21136·4
27·81	1			"	"	45·6
10·68	1			"	"	21222·6
4699·82	2		4702·73 (not seen)	"	5·9	71·5
95·82	2			"	"	89·6

† Cf. Xenon II. 5143·24 (1), 4857·37 (1).

SECOND KRYPTON SPECTRUM—*continued*.

Wave-length	Intensity and Character	Liveing and Dewar	Range	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda}$	
4694.59	4	4694 (3)	† 4694.82 (2)	1.29	5.9	21295.2
93.83	1			"	"	98.7
91.46	2			1.28	"	21309.4
89.95	1			"	"	16.3
87.46	1			"	"	27.6
86.43	1			"	"	32.3
80.57	4	4680 (5)	4680.67 (3)	"	"	59.0
73.96	1			"	"	89.2
72.22	< 1			"	"	97.2
59.04	5	4659 (8)		"	"	21461.7
55.94	< 1			"	"	72.0
50.33	2	4650 (1)		1.27	"	97.9
38.53	2			"	"	21552.6
34.05	5	4635 (6)	4634.07 (4)	"	6.0	73.4
21.58	1			"	"	21631.6
20.21	< 1			"	"	38.0
19.31	6	4620 (8)	4619.30 (5)	"	"	42.2
15.46	5	4615	4615.48 (4)	1.26	"	60.3
14.67	2			"	"	64.0
13.93	1			"	"	67.3
10.79	3	4610 (3)		"	"	82.3
07.03	< 1			"	"	21700.0
04.16	2			"	"	13.5
4598.64	2	4598 (1)		"	"	39.6
92.94	3n	4593 (2)		"	"	66.5
83.03	4	4583 (4)		"	"	21813.6
* 77.40	6	4577 (8)	4577.31 (4)	1.25	"	40.5
75.87	1			"	"	47.8
73.52	2			"	"	59.0
56.77	4			"	6.1	21939.3
37.45	1			1.24	"	22032.7
36.67	ln			"	"	36.5
23.32	5	4525 (3)		"	"	22101.5
18.82	1			"	"	23.6
† 02.56	1	† 4505 (2)		1.23	"	22203.5
4490.04	4	4490 (2)		"	6.2	65.3
75.18	7	4475 (6)		"	"	22339.3
† 63.88	1	4464 (3)	4464.11 (not seen)	1.22	"	95.8
60.18	1			"	"	22414.4
57.42	2			"	"	28.3
54.55	1			"	"	42.8
† 54.12	1	4454 (1)		"	"	44.9
53.38	3			"	"	48.7
43.87	1			"	"	96.7
43.46	2			"	"	98.8
36.98	4	4437 (6)	4436.96 (2)	"	"	22531.6
31.85	4	4432 (6)		"	"	57.7
22.86	4	4423 (2)		1.21	6.3	22603.5
17.40	2			"	"	31.4
†§ 08.10	2			"	"	79.2

\* Cf. Xenon II. 4577.36 (6).

† First Krypton spectrum.

‡ Visible in the spectrum of atmospheric Argon.

§ 4408.095, Kayser in the blue Argon spectrum (1).

SECOND KRYPTON SPECTRUM—*continued.*

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
4404.47	1			1.21	6.3	22697.9
00.98	1			"	"	22715.9
4399.57	1	4400 (1)		"	"	23.2
89.87	1			1.20	"	73.4
86.69	4	4387 (3)		"	"	89.9
85.39	1			"	"	96.7
81.71	3			"	"	22815.8
77.89	2			"	"	36.1
* 76.33	ln	4376 (3)	4376.24	"	"	43.9
76.20	1			"	"	44.6
69.86	4			"	"	77.7
67.27	< 1			"	6.4	91.2
66.43	< 1			"	"	95.6
* 62.83	1	4363 (2)	4362.76	"	"	22914.5
55.84	1			1.19	"	51.3
* 55.67	10	4356 (12)	4355.62 (5)	"	"	52.2
55.14	2			"	"	55.0
52.76	< 1			"	"	67.5
51.20	2n			"	"	75.8
44.42	1			"	"	23011.6
44.05	< 1			"	"	13.6
41.50	< 1			"	"	27.1
33.50	2			"	"	69.6
23.16	4	4323 (2)		"	"	23124.8
* 19.76	1	4320 (8)	4319.760	"	"	43.0
19.30	1	4319 (3)		1.18	"	45.5
* 18.74	1	4318 (3)	4318.70	"	"	48.5
17.98	5	4318 (3)	4318.22 (2)	"	"	52.6
05.37	2			"	6.5	23220.3
01.71	3			"	"	40.1
* 00.67	5	4301 (7)		"	"	45.7
4295.35	1			"	"	76.4
94.99	2			"	"	86.7
93.10	6	4293 (10)	4293.10 (5)	"	"	23340.7
* 83.17	2	4283 (3)		"	"	49.0
81.65	< 1			"	"	53.8
80.77	ln			1.17	"	90.0
* 74.15	2	4274 (4)	4274.09	"	"	92.7
73.65	< 1			"	"	23418.3
68.97	3			"	"	19.7
68.72	2	4269 (3)		"	"	69.9
59.60	3	4260 (1)		"	"	95.4
54.98	3	4256 (1)		"	6.6	23506.9
52.87	2			"	"	18.6
50.76	4	4251 (5)		"	"	54.3
44.32	1			"	"	94.4
37.11	2			1.16	"	96.1
36.81	3	4237 (4)		"	"	23619.8
†† 28.98	1			"	"	52.2
26.75	3			"	"	55.9
26.09	3			"	"	59.8
25.50	1			"	"	

\* First Krypton spectrum.

† Visible in the spectrum of atmospheric Argon.

†† 4229.015, Kayser in the blue Argon spectrum (1).



SECOND KRYPTON SPECTRUM—*continued*.

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda}$	
4223.22	< 1			1.16	6.6	23672.1
22.36	1			"	"	76.8
01.84	1			1.15	"	92.7
01.55	< 1			"	"	94.1
4185.29	2n	4185 (3)		"	"	23786.6
79.67	2n			"	"	23918.7
72.63	2			"	"	59.1
71.97	2	4172 (1)		"	"	62.9
60.37	1			1.14	6.7	24029.6
59.13	1			"	"	36.8
54.62	4			"	"	62.9
45.28	6	4145 (8)	4145.27 (3)	"	6.8	24116.6
39.28	4n	4140 (2)		"	"	52.0
38.12	4			"	"	58.8
34.72	3			"	"	78.6
33.81	< 1			"	"	84.0
31.48	4			"	"	97.6
18.28	2n	4119 (3)		1.13	"	24275.2
13.90	1			"	"	24301.0
09.38	6	4109 (6)		"	"	27.8
4098.89	7	4099 (8)		"	6.9	89.9
88.48	8	4089 (8)	4088.53 (6)	1.12	"	24452.1
* 82.58	4			"	"	87.4
69.97	4n			"	"	24565.3
67.53	5			"	"	78.0
65.22	8	4065 (7)	4065.19 (3)	"	"	92.0
59.02	4n	4058 (6)		"	"	24629.6
57.17	8	4058 (6)	4057.16 (2)	"	"	40.8
54.43	1			1.11	"	63.6
50.62	5n			"	7.0	80.6
46.30	1			"	"	24706.9
44.80	5	4045 (4)		"	"	16.1
37.96	4	4038 (2)		"	"	58.0
35.53	2			"	"	72.9
26.38	1n			"	"	24829.2
24.72	2n			"	"	39.4
08.60	2n	4008 (2)		{ 1.10	"	24939.4
08.21	3				"	41.8
05.70	3n				"	57.4
02.73	3			"	7.1	75.9
3998.10	5	3997 (3)		"	"	25004.8
96.81	< 1			"	"	12.9
94.98	6	3994 (6)		"	"	24.3
92.08	2			"	"	42.5
90.79	2n			"	"	50.6
87.93	4	3988 (2)		"	"	68.6
87.22	1n			"	"	73.0
65.02	4	3965 (1)		1.09	"	25213.5
62.46	1			"	"	29.7
57.82	4			"	"	59.3
54.90	5	3955 (2)		"	7.2	77.9
53.71	3			"	"	85.7

\* A line occurs in the blue spectrum of Argon of wave-length 4082.535 (Kayser), which does not disappear on fractionation (2).

SECOND KRYPTON SPECTRUM—*continued*.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
3952.16	3n			1.09	7.2	25295.4
47.76	1			"	"	25323.5
45.60	1			"	"	37.5
42.78	2n			"	"	55.6
* 42.28	1			"	"	58.8
41.03	1n			"	"	66.9
38.98	2	3939 (1)		"	"	80.1
38.62	1			"	"	82.4
34.29	3n			1.08	"	25410.3
32.80	4n	?		"	"	20.0
29.34	3n	3928 (3)		"	"	42.4
24.91	1n			"	"	71.1
21.81	2n			"	"	91.4
20.29	8	3921 (8)	3920.59 (1)	"	"	25501.1
17.76	6	3918 (2)		"	"	17.6
17.03	1			"	"	22.3
14.04	1			"	"	41.8
13.01	1			"	"	48.6
12.69	5	3913 (6)	3912.36 (1)	"	"	50.7
06.37	8	3907 (6)		"	7.3	91.9
01.28	2	3901 (1)		"	"	25625.6
3898.83	3			"	"	41.4
94.83	5	3896 (3)		1.07	"	67.7
84.04	1			"	"	25739.1
83.77	1			"	"	40.9
75.95	2 }	3876 (7)		"	"	92.8
75.56	7 }			"	"	95.4
74.15	2			"	"	25804.8
73.38	2n			"	"	09.9
63.99	5n	3862 (1)		"	"	72.7
60.58	5	3859 (1)		"	"	95.5
58.90	2n	3859 (1)		"	"	25906.8
57.44	3			"	"	16.6
50.23	2n			1.06	"	65.2
47.93	1n			"	"	70.7
47.63	1			"	"	82.7
46.99	1	3847 (1)		"	"	87.1
44.55	2n	3844 (2)		"	"	26003.5
42.98	1n			"	"	14.1
42.40	3	3842 (1)		"	"	18.1
39.49	1	3839 (1)		"	"	37.8
36.64	3	3837 (2)		"	"	57.2
35.47	1			"	"	65.1
35.10	2n			"	"	67.6
21.93	1n			"	"	26157.5
17.23	3	3817 (2)		"	7.4	89.7
14.70	2n			1.05	"	26207.0
09.30	2			"	"	44.1
06.46	1 }	3806 (2)		"	"	63.7
06.28	1 }			"	"	65.0
04.80	4	3805 (3)		"	"	75.2
3793.35	1			"	"	26354.5
92.82	4			"	"	58.2

\* Cf. Xenon II. 3942.29 (1).

## SECOND KRYPTON SPECTRUM—continued.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
3791.22	2n			1.05	7.4	26369.3
88.26	2n			"	"	89.9
85.76	1n			"	"	26407.4
83.28	10	3784 (10)	3783.40 (4)	"	"	24.7
80.70	1			"	"	42.7
78.23	10	3779 (8)	3778.29 (4)	"	"	60.0
76.66	1n			1.04	"	71.0
75.68	1			"	"	77.9
73.20	2			"	"	95.3
71.46	4	3772 (4)		"	7.5	26507.4
* 68.10	1n			"	"	31.1
* 65.98	1n			"	"	46.0
59.04	2n	3759 (2)		"	"	95.0
55.92	1n			"	"	26617.1
54.35	5	3755 (6)		"	"	28.3
† 51.81	1			"	"	46.2
49.77	3n			"	"	60.8
44.95	9	3746 (6)		"	"	95.1
41.83	10	3742 (6)	3741.85 (3)	"	"	26717.4
40.87	2			"	"	24.2
40.37	1			"	"	27.8
35.91	5	3736 (3)		1.03	"	59.7
† 33.09	2	3734 (4)		{	"	80.0
32.77	3				"	82.3
31.82	1				"	89.1
28.13	2n			"	7.6	26815.5
26.45	2			"	"	27.4
21.50	7	3722 (5)		"	"	63.3
18.79	8	3719 (10)		{	"	82.9
18.17	10				"	87.3
16.28	1				"	26901.0
15.18	3	3715 (1)		"	"	09.0
08.23	1n			"	"	59.4
3696.84	1			1.02	"	27042.5
90.80	5	3691 (1)		"	"	86.8
86.30	6	3687 (5)	3686.26 (1)	"	"	27119.9
80.64	1	3681 (7)		{	"	61.3
80.52	7				7.7	62.4
78.77	2				"	75.3
74.37	1			"	"	27207.8
70.38	1			"	"	37.4
69.16	9	3670 (7)		"	"	46.4
68.74	2	3667 (1)		{	"	49.6
66.15	3				"	68.9
63.57	4				"	88.1
61.15	4	3661 (3)		"	"	27306.1
60.20	1			"	"	13.2
54.11	10	3654 (10)	3654.11 (3)	1.01	"	58.7
48.74	5	3649 (3)		"	"	99.0
44.36	1			"	"	27431.9
41.48	4			"	"	53.7

\* Cf. Xenon II. 3768.08 (1), 3765.99 (4).

† Cf. Xenon II. 3751.80 (1).

‡ 3733.122 (1) in blue spectrum of Argon (Kayser).

§ First Krypton spectrum.

## SECOND KRYPTON SPECTRUM—continued.

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
3637.63	4	3638 (4)		1.01	7.8	27482.6
34.54	2n			"	"	27506.0
33.69	2			"	"	12.4
32.62	1			"	"	20.5
32.02	10	3632 (10)		"	"	25.1
27.20	1			"	"	61.7
23.74	4	3624 (1)		"	"	88.0
15.97	3			1.00	"	27647.3
11.21	1			"	"	83.7
08.02	9	3608 (6)		"	"	27708.2
04.10	1			"	"	38.4
02.26	1n			"	"	52.5
00.05	6	3600 (6)		"	"	69.6
3599.35	4			"	"	75.0
98.14	1			"	"	84.3
96.99	1			"	"	93.2
89.79	7	3590 (3)		"	7.9	27848.9
86.40	2			"	"	75.2
80.11	1			"	"	27924.2
77.74	1			0.99	"	42.7
72.82	3n	3574 (1)		"	"	81.2
67.88	2			"	"	28019.9
* 64.38	4			"	"	47.5
63.48	1			"	"	54.6
62.23	1			"	"	64.4
55.69	2n			"	"	28116.0
53.61	4	3554 (2)		"	"	32.5
49.57	3			"	8.0	64.4
48.86	2			"	"	70.1
44.69	5	3545 (6)		"	"	28203.2
44.29	5			"	"	06.7
† 35.48	6			0.98	"	76.7
27.53	1			"	"	28340.4
24.93	1			"	"	61.4
21.27	1			"	"	90.8
17.52	1			"	"	28421.1
14.68	3			"	"	44.9
07.58	9			"	8.1	28501.6
03.38	6	3503 (2)		"	"	35.8
3498.63	1n			0.97	"	74.5
97.29	3			"	"	85.5
93.16	2			"	"	28619.3
92.94	2			"	"	21.1
88.74	8	3489 (2)		"	"	55.5
87.61	1			"	"	64.8
78.04	1			"	"	28743.7
74.79	7			"	"	70.6
71.52	< 1			"	"	97.7
71.16	1			"	"	28800.7
70.19	7	3470 (1)		"	8.2	08.7
65.54	1n			"	"	47.3
60.24	6	3460 (3)		"	"	91.5
48.87	4			0.96	"	28986.8

\* Cf. Xenon II 3564.40 (4).

† Cf. Argon 3535.514 (4) Kayser.



## SECOND KRYPTON SPECTRUM—continued.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda}$	
3447.01	3			0.96	8.2	20902.4
46.66	7n			"	"	05.4
45.43	1			"	"	15.8
43.01	1			"	"	36.2
39.60	6			"	"	65.0
39.03	1			"	"	69.8
31.85	1			"	8.3	29130.1
31.15	2			"	"	38.4
* 28.95	1			"	"	55.1
27.84	4			"	"	64.6
23.87	3			"	"	98.4
14.95	1			0.95	"	29274.7
05.28	7			"	"	29357.8
* 3396.72	2			"	"	29431.9
89.80	1			"	8.4	91.9
89.06	3			"	"	98.3
* 87.26	1			"	"	29514.0
85.35	1			"	"	30.6
† 81.24	2			"	"	66.5
* 79.18	1			"	"	84.6
75.09	4			0.94	"	29620.4
* 60.22	2			"	8.5	29751.5
52.07	6			"	"	29823.8
49.61	3n			"	"	45.7
48.28	2			"	"	57.6
42.59	5			"	"	29908.4
41.70	1n			"	"	16.4
40.61	2n			"	"	26.1
37.99	1n			0.93	"	49.6
36.84	1n			"	"	60.0
32.61	3			"	"	98.0
* 30.88	7			"	"	30013.6
29.86	1n			"	"	22.8
28.34	1n			"	"	36.5
25.84	9			"	"	59.1
24.23	1n			"	8.6	72.6
21.28	1			"	"	30100.4
20.39	1n			"	"	08.3
19.48	1			"	"	16.6
* 15.80	1			"	"	50.0
11.59	6			"	"	88.4
08.28	4			"	"	30216.6
05.79	1n			"	"	41.3
04.87	5			"	"	49.7
01.97	1			"	"	76.2
3294.02	1			0.92	"	30349.5
86.01	4			"	8.7	30423.3
85.30	1			"	"	29.4
82.21	1			"	"	58.6
71.77	4			"	"	30555.8

\* Cf. Xenon II., 3428.95 (1), 3396.72 (2), 3387.26 (1), 3379.20 (2), 3360.20 (2), 3330.90 (6), 3315.80 (1).

† A line is given by Eder and Valenta in the blue Argon spectrum at 3381.27. This line was not seen by Kayser nor Baly.

## SECOND KRYPTON SPECTRUM—continued.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
3268.61	7			0.92	8.7	30585.3
64.94	8			"	"	30619.7
61.70	1n			"	"	50.2
48.16	1n			0.91	8.8	30777.9
47.14	1n			"	"	87.5
46.74	2			"	"	91.3
45.82	10			"	"	30800.1
40.55	6			"	"	50.2
39.64	6			"	"	58.8
37.94	1			"	"	85.0
35.29	1			"	"	30900.3
24.99	3			"	"	99.0
23.66	1n			"	"	31011.8
* 22.40	1			"	"	24.0
20.76	4			0.90	"	39.8
16.39	1			"	"	82.0
11.04	1			"	8.9	31133.7
08.39	3			"	"	59.4
07.91	4			"	"	64.0
05.40	1n			"	"	88.4
02.67	1n			"	"	31215.0
00.53	3			"	"	35.9
3191.33	6			"	"	31326.0
89.23	7			"	"	46.6
77.09	1n			0.89	9.0	31466.3
* 75.78	2n			"	"	79.3
71.06	3			"	"	31526.2
51.88	3			"	"	31718.1
51.06	5			"	"	26.3
44.90	1			"	9.1	88.4
44.47	2			"	"	92.8
42.01	5			"	"	31817.7
41.48	6			0.88	"	23.0
39.71	3			"	"	41.0
* 38.49	1			"	"	53.4
36.33	2			"	"	75.3
35.24	1			"	"	86.4
24.62	6			"	"	95.8
22.61	3			"	"	32015.4
20.73	4			"	"	34.7
12.36	5			"	9.2	32120.8
05.48	1			"	"	91.9
01.85	1			0.87	"	32229.6
3097.27	4			"	"	77.3
96.59	3n			"	"	84.4
95.24	1n			"	"	98.5
63.26	5			"	9.3	32635.7
62.55	1			0.86	"	43.2
60.99	2n			"	"	59.8
56.86	4			"	"	32704.0
56.14	2			"	"	11.7
49.83	2			"	9.4	78.3
47.07	5			"	"	32809.0

\* Cf. Xenon II. 3222.40 (1), 3175.80 (3), 3138.46 (6).

SECOND KRYPTON SPECTRUM—*continued*.

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
*3044.92	1			0.86	9.5	32832.2
24.57	4			0.85	"	33057.0
22.43	3			"	"	76.3
17.78	2 <sub>n</sub>			"	"	33127.4
13.36	1			"	"	76.0
08.57	2			"	"	33224.9
02.39	1			"	"	97.3
2999.99	3 <sub>n</sub>			"	"	33323.9
96.77	2			"	9.6	59.6
92.36	3			"	"	33408.8
86.02	1			"	"	79.8
83.22	1			"	"	33511.2
79.95	3			0.84	"	48.0
79.01	3			"	"	58.6
76.44	1			"	"	87.6
76.06	1			"	"	91.9
74.18	3			"	"	33613.1
71.90	1			"	"	38.9
68.44	2			"	9.7	78.0
67.37	5			"	"	90.2
63.26	1			"	"	33736.9
61.19	2			"	"	60.5
* 60.92	2			"	"	63.6
60.27	3 <sub>n</sub>			"	"	71.0
58.48	2 <sub>n</sub>			"	"	91.4
56.44	1			"	"	33814.8
54.40	2			"	"	38.1
52.69	4			"	"	57.7
52.23	1			"	"	63.0
50.33	3			"	"	84.8
49.67	2			"	"	92.4
48.27	1			"	"	33908.5
40.05	1			0.83	9.8	34003.2
38.70	1			"	"	38.8
35.36	2			"	"	46.0
34.13	1			"	"	71.8
31.03	1			"	"	34107.9
30.72	1			"	"	11.5
27.69	1			"	"	46.8
17.81	1			"	9.9	34262.4
15.88	1			"	"	85.1
15.40	1			"	"	90.7
13.35	1			"	"	34314.8
09.30	2			"	"	62.6
08.74	1			"	"	69.2
00.19	3			0.82	"	34470.6
2893.81	4			"	10.0	34546.5
92.30	5			"	"	64.6
73.84	1			"	"	34786.6
72.99	1			"	"	96.9
70.73	4			"	10.1	34824.2
51.29	3			0.81	"	35061.7
47.51	4			"	10.2	35108.2

\* Cf. Xenon II. 3044.91 (1), 2960.93 (2).

SECOND KRYPTON SPECTRUM—*continued*.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda}$	
*2844.59	3			0.81	10.2	35144.2
* 41.10	1			"	"	87.4
38.92	3			"	"	35214.5
36.08	1			"	"	49.7
35.49	2n			"	"	57.1
33.11	6			"	"	86.7
30.55	1n			"	"	35318.6
29.60	1			"	"	30.5
22.75	1			0.80	10.3	35416.1
17.00	4			"	"	88.5
16.58	6			"	"	93.7
* 14.62	2			"	"	35518.5
14.09	1			"	"	25.2
* 11.81	2			"	"	54.0
06.21	1			"	"	35625.0
03.71	1			"	"	56.7
03.32	4			"	"	61.7
01.25	1n			"	"	87.9
2795.92	5			"	10.4	35756.0
90.31	1			"	"	35827.9
79.63	1			0.79	"	65.6
79.23	3			"	"	70.8
78.34	1			"	"	82.3
74.70	1			"	10.5	36029.4
72.73	2			"	"	55.0
61.87	1			"	"	36196.9
59.16	1n			"	"	36232.4
* 56.66	1			"	"	65.3
52.33	1			"	"	36322.3
51.71	1n			"	"	30.5
50.49	1			"	10.6	46.6
48.18	1			"	"	77.1
42.67	4			"	"	36450.1
42.13	1			"	"	57.4
* 33.38	4			0.78	"	36574.1
* 32.46	1			"	"	86.4
30.55	1			"	"	36612.0
30.02	1			"	"	29.2
29.58	4			"	"	55.1
20.03	1n			"	10.7	36753.6
16.27	3			"	"	36804.5
15.31	1			"	"	17.5
14.61	1			"	"	27.0
12.50	8			"	"	55.7
11.22	1			"	"	73.2
10.37	1			"	"	84.6
01.45	3			"	10.8	37006.4
00.73	1			"	"	16.2
2698.20	1			0.77	"	50.9
97.41	4			"	"	61.8
† 96.71	4			"	"	71.4
95.81	4			"	"	83.8

\* Cf. Xenon II. 2844.59 (3), 2841.10 (1), 2814.62 (6), 2811.81 (3), 2756.64 (1), 2733.36 (4), 2732.48 (1).

† Cf. Xenon II. 2696.73 (4).



SECOND KRYPTON SPECTRUM—*continued.*

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
2694.93	3			0.77	10.8	37095.9
92.65	1			"	"	37127.3
* 91.94	1			"	"	37.1
91.31	1			"	"	45.8
* 90.35	1			"	"	59.1
88.44	1			"	"	85.5
83.66	3			"	"	37250.6
81.29	4			"	"	84.7
80.80	1			"	"	91.5
80.44	3			"	"	96.5
79.73	2			"	"	37306.4
* 77.30	2			"	10.9	40.2
76.10	1			"	"	56.9
75.41	1			"	"	66.5
* 70.78	2			"	"	37431.3
64.10	2n			"	"	37525.2
61.34	1			"	"	65.4
61.09	2n			"	"	67.7
56.49	2n			"	"	37632.8
54.07	1			0.76	11.0	67.0
49.84	1n			"	"	37727.1
49.38	3			"	"	33.7
* 48.80	1			"	"	41.9
48.55	1			"	"	45.5
48.26	4			"	"	49.6
43.18	3			"	"	37822.2
42.19	1			"	"	36.4
40.84	1			"	"	55.6
39.86	4			"	"	69.8
34.52	1			"	"	37946.6
30.76	2			"	11.1	38000.7
29.00	3			"	"	26.2
28.19	1			"	"	37.9
27.86	2			"	"	42.7
27.34	1			"	"	50.2
24.90	1n			"	"	85.6
† 24.63	1			"	"	89.5
† 20.54	4			"	"	38149.1
† 16.80	2			"	"	38203.5
11.08	3			"	"	87.1
04.72	1			0.75	11.2	38380.5
04.59	1			"	"	82.6
02.23	2			"	"	38417.4
2597.80	2			"	"	82.9
96.83	1n			"	"	97.3
95.44	1n			"	"	38517.9
94.49	1			"	"	32.0
92.57	5			"	"	60.6
91.33	1			"	"	79.0
90.83	1			"	"	86.5
89.19	4			"	"	38610.9
84.21	1			"	11.3	85.2

\* Cf. Xenon II. 2691.92 (1), 2690.33 (1), 2677.29 (8), 2670.80 (2), 2648.79 (1).

† Cf. Xenon II. 2624.65 (1), 2616.79 (1).

## SECOND KRYPTON SPECTRUM—continued.

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
*2581·84	1n			0·75	11·3	38720·8
74·87	1			"	"	38825·6
* 72·44	1			"	"	62·3
72·14	2			"	"	66·8
71·30	1			"	"	79·5
70·54	1			"	"	91·0
65·72	1			"	11·4	38964·0
63·32	2			0·74	"	39002·0
62·05	1			"	"	19·8
59·20	2			"	"	63·3
58·08	1			"	"	80·4
56·44	2			"	"	39105·5
56·01	2			"	"	12·1
55·23	2			"	"	24·1
54·35	2			"	"	37·5
53·26	1			"	"	54·2
48·68	1			"	11·5	39224·5
44·79	1			"	"	84·5
38·43	2n			"	"	39382·9
37·67	1			"	"	94·7
35·97	1			"	"	39421·1
28·51	1			"	11·6	39537·4
27·26	2n			"	"	57·0
25·56	1n			"	"	83·5
25·07	2			"	"	91·3
19·38	1			"	"	39680·7
18·02	1			"	"	39702·1
15·50	1			0·73	"	41·9
* 13·50	1			"	"	73·6
13·03	1			"	"	81·0
11·83	1			"	11·7	99·9
06·97	1			"	"	39877·1
06·66	2n			"	"	82·0
03·97	3n			"	"	39924·6
00·72	1			"	"	76·8
2498·84	1			"	"	40006·9
97·81	1			"	"	23·4
97·51	1n			"	"	28·2
† 94·10	2			"	"	82·9
89·51	3			"	11·8	40156·9
87·75	2			"	"	85·2
87·58	2			"	"	87·9
86·40	2			"	"	40207·0
85·68	2			"	"	18·6
83·71	2			"	"	50·5
83·32	2			"	"	56·9
83·09	1			"	"	70·7
78·97	4			"	"	40327·5
74·99	2			"	11·9	92·3
74·79	2			"	"	95·6
74·06	1			"	"	40407·5
73·39	1			"	"	18·4
72·24	1			"	"	37·2

\* Cf. Xenon II. 2581·84 (1), 2572·46 (2), 2513·52 (1).

† Cf. Xenon II. 2494·11 (3).

SECOND KRYPTON SPECTRUM—*continued.*

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
2470.50	2			0.73	11.9	40465.7
* 68.56	2			0.72	"	97.5
67.00	2			"	"	40523.2
65.91	2			"	"	40.1
64.87	8			"	"	58.2
59.74	1			"	12.0	40642.7
57.79	2			"	"	75.0
56.16	6			"	"	40701.9
55.42	1			"	"	14.2
54.19	1			"	"	34.6
53.37	2			"	"	48.3
52.38	3			"	"	64.7
46.56	2			"	"	40861.9
42.68	1			"	12.1	40926.5
40.96	1			"	"	55.4
39.64	1			"	"	77.6
39.32	2			"	"	82.9
28.44	3			"	"	41166.6
26.46	3			"	12.2	99.8
* 25.15	1n			"	"	41224.3
20.30	1			0.71	"	41305.0
18.13	1			"	"	42.1
&c.						

\* Cf. Xenon II. 2468.54 (2), 2425.18 (2).

## FIRST XENON SPECTRUM, WITHOUT LEYDEN JAR AND SPARK GAP.

\*\* The figures in parentheses indicate the intensities.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
6198.70	1			1.69	4.4	16128.0
82.92	3	6183 (1)		1.68	"	69.2
80.16	1	6181 (1)		"	"	76.4
78.80	2			"	"	80.0
64.30	2	? 6166 (1)		"	"	16218.0
12.58	1	5935 (1)		1.67	"	16355.3
		(not seen)				
5895.20	1	5895 (1)		1.61	4.6	16958.3
75.30	1	5876 (1)		1.60	"	17015.8
		5856 (1)				
		(not seen)				
24.98	1	5825 (2)	{	1.59	4.7	17162.7
24.08	1			"	"	65.4
5716.20	2n			1.58	4.8	17489.3
5696.68	1			1.55	"	17549.3
95.96	2			"	"	51.5
88.59	1			"	"	74.2

## FIRST XENON SPECTRUM—continued.

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
5649.77	< 1			1.54	4.8	17695.0
19.07	2			1.53	"	17791.7
12.84	< 1			"	"	17811.4
5581.96	1			1.52	4.9	17910.0
80.60	1			"	"	14.3
79.48	< 1			"	"	17.9
63.83	2			"	"	68.3
52.59	2			1.51	"	18004.7
5488.73	< 1			1.50	5.0	18214.1
40.16	1n			1.49	"	18376.8
5394.84	1			1.47	5.1	18531.1
92.94	2			"	"	37.7
63.74	< 1			1.46	"	38.6
5028.42	2	5025 (1)		1.42	5.5	19881.5
		(not seen)				
4923.28	6	4924 (4)		1.35	5.6	20306.0
16.63	6	4917 (4)		1.34	"	33.5
4843.44	2			1.33	5.7	20640.8
29.87	4	4820 (1)		1.32	"	98.8
* 07.19	6	4807 (1)		"	"	20796.5
4792.77	1			1.31	"	20860.1
* 34.30	8	4734 (1)		1.30	5.8	21116.6
4697.17	7			1.29	5.9	21283.5
91.13	1	Band of close lines		1.28	"	21310.9
83.83	1			"	"	44.1
* 71.42	10			"	"	21400.9
68.32	1			"	"	15.0
58.94	1			"	"	58.2
* 24.46	15	4624 (2)		1.27	6.0	21618.2
12.06	2			1.26	"	76.3
4582.89	5			"	"	21817.2
24.83	6	4525 (5)		1.24	6.1	22094.2
* 01.13	10	4500 (1)		1.23	"	22205.6
4385.97	1	4386 (3)		1.20	6.3	22793.7
84.12	2			"	"	22803.3
76.35	3	4375 (4)		"	"	43.8
58.51	3			"	6.4	22937.2
4203.87	2	4204 (1)		1.15	6.6	23781.0
4193.70	8			"	6.7	23938.6
93.19	1	4193 (6)		"	"	41.4
35.27	1			1.14	6.8	24175.4
16.25	7			1.13	"	24287.1
09.84	5			"	"	24325.0
4078.94	10	4079 (1)		1.12	6.9	24509.3
46.71	3			1.11	7.0	24704.4
3985.39	3			1.10	7.1	25084.5
74.61	3			1.09	"	25152.6
67.74	10			"	"	96.2
51.16	10	3951 (6)		"	7.2	25301.8
48.93	1			"	"	15.7
48.38	3			"	"	19.6
* 3826.99	2	3826 (1)		1.06	7.3	26122.9
23.86	1			"	"	44.3

\* Visible in the second Xenon spectrum.



FIRST XENON SPECTRUM—*continued.*

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
3810·01	2			1·05	7·4	26239·2
04·96	3					74·1
01·54	1			"	"	97·7
3796·47	3			"	"	26332·9
73·58	1			1·04	"	26492·6
45·54	1			"	7·5	26691·0
3693·69	3			1·02	7·6	27065·6
86·08	3			"	"	27121·5
79·77	1			"	7·7	67·9
70·10	1			"	"	27239·5
65·53	1			"	"	73·5
63·52	< 1			"	"	88·4
55·03	1			1·01	"	27351·8
50·36	4			"	"	86·9
10·47	2			1·00	7·8	27689·4
3554·16	2			0·99	7·9	28128·1
49·99	2			"	8·1	61·0
06·90	1			0·98	"	28507·1
3472·48	< 1			0·97	"	28789·8
69·95	< 1			"	8·2	28810·7
3341·65	1			0·94	8·5	29916·8
3132·01	2			0·88	9·1	31919·2
31·66	1			"	"	23·9
* 25·85	2			"	"	82·2
3022·09	1			0·85	9·5	33080·2
2536·58	2			0·74	11·5	39420·1

\* Visible in the second Xenon spectrum.

## SECOND XENON SPECTRUM, WITH LEYDEN JAR AND SPARK GAP.

\*\* The figures in parentheses indicate the intensities.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
6097·80	7	6097 (6)		1·66	4·4	16395·0
51·36	7	6051 (6)		1·65	4·5	16520·7
36·40	6	6036 (5)		1·64	"	61·7
5976·67	7	5976 (6)		1·63	"	16727·3
71·32	1	5972		"	"	42·2
45·71	1	5946 (2)		1·62	4·6	16814·2
		5935 (not seen)				
17·73	1			1·61	"	93·8
05·40	1	5906 (1)		"	"	16929·2
5893·59	1	? 5895 (1)		"	"	63·0
16·21	1	5817 (1)		1·58	4·7	17188·6
5776·46	3	5777 (4)		1·57	"	17306·4
58·92	4	5759 (4)		"	"	59·7

SECOND XENON SPECTRUM—*continued*.

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
5754.38	1n			1.57	4.7	17373.4
52.79	1			"	"	78.2
51.28	5	5751 (5)		"	"	82.7
48.95	1			"	"	89.8
27.15	5	5727 (4)		1.56	"	17456.0
19.83	6	5720 (4)		"	4.8	78.2
16.36	1			"	"	88.8
08.74	1			"	"	17512.2
01.48	1	At 5700 (6) (not seen)		1.55	"	34.5
5699.80	1			"	"	39.7
86.73	1			"	"	80.0
75.41	1			"	"	17615.0
71.15	3			"	"	28.3
67.85	6	5668 (4)		"	"	38.6
59.67	5	5660 (1)		1.54	"	64.1
33.32	1			"	"	17746.7
25.18	1			1.53	"	72.4
19.18	1			"	"	91.4
16.99	6	5617		"	"	98.3
13.14	1			"	"	17810.5
07.18	1	5609 (1)		"	4.9	29.4
04.66	1			"	"	37.4
5595.32	2n			"	"	67.2
91.96	1			"	"	77.9
84.00	2n	5583 (1)	{	1.52	"	17903.4
82.30	2n			"	"	08.9
72.48	2	5573 (1)		"	"	40.4
70.60	1			"	"	46.5
53.08	1			"	"	18003.1
48.40	1			1.51	"	18.3
31.33	7	5532 (4)		"	"	73.9
25.81	2			"	"	92.0
24.63	1			"	"	95.9
18.96	1			1.50	"	18114.4
07.72	1			"	"	51.4
5495.20	1			"	5.0	92.7
81.38	3n			"	"	18238.6
72.90	7	5473 (3)		1.49	"	66.8
69.81	1			"	"	77.2
60.63	6	5461 (3)		"	"	18307.9
53.33	1			"	"	32.4
51.22	1			"	"	39.5
50.71	5	5451 (1)		"	"	41.2
45.70	2			"	"	58.1
39.19	8	5439 (3)		1.48	"	80.1
19.40	10	5420 (10)	5419.38 (as a weak krypton line)	"	"	18447.6
15.64	1			"	"	60.0
13.74	2			"	"	66.5
01.23	3			1.47	5.1	18509.2
5386.90	1			"	"	58.5
72.62	8	5372 (6)		"	"	18607.8
68.30	3	5368 (1)		"	"	22.8

SECOND XENON SPECTRUM—*continued*.

Wave-length	Intensity and Character	Lineing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
5367.29	1			1.47	5.1	18626.3
63.47	2			1.46	"	39.5
39.56	9	5339 (6)		"	"	18723.0
28.10	1			"	"	63.3
14.15	8	5313 (1)		1.45	"	18812.6
11.15	1			"	"	23.2
09.49	4	5309 (1)		"	"	29.1
5292.40	10	5292 (10)	5292.37 (as a weak krypton line)	"	5.2	89.8
68.50	1			1.44	"	18975.5
62.16	5	5262 (2)		"	"	98.4
60.65	5	5260 (2)		"	"	19003.9
60.10	1			"	"	05.8
47.98	1			1.43	"	49.7
39.14	2	5240		"	"	81.9
26.84	1	5227 (1)		"	"	19126.8
23.85	1			"	"	37.8
06.52	1			1.42	5.3	19201.4
01.64	1	5202 (1)		"	"	19.4
5192.36	1	5192 (6)		"	"	53.8
91.60	5			"	"	56.6
88.28	4	5189 (3)		"	"	68.9
84.68	2	5185 (3)		"	"	82.3
79.02	3	5179 (3)		"	"	19303.4
* 43.24	1			1.41	"	19437.7
25.94	3	5126 (3)		1.40	"	19503.3
22.65	3	5123 (1)		"	"	15.9
07.58	3	5107 (3)		"	5.4	73.3
5099.96	1			1.39	"	19602.6
92.22	3			"	"	32.4
80.88	7	5080 (2)		"	"	76.2
		5068 (5)				
		(not seen)				
52.74	1	5052 (1)		1.38	"	19785.8
45.09	3	5045 (6)		"	"	19815.9
41.62	1			"	"	29.5
28.62	1	? 5025 (1)		"	"	80.8
13.04	1			1.37	5.5	19942.5
08.74	1			"	"	59.6
01.20	1			"	"	89.7
4994.27	1			"	"	20017.4
93.22	1			"	"	21.7
91.36	2			"	"	29.1
88.22	2	4988 (4)		1.36	"	41.7
78.49	4			"	"	80.8
71.85	1	4972 (2)		"	"	20107.7
23.40	1			1.35	5.6	20306.6
21.68	6	4922 (8)		"	"	12.7
19.85	4			"	"	20.2
16.71	1			1.34	"	33.2
4890.24	5	4890 (3)		"	"	20443.2
87.47	5	4887 (not given)		"	"	54.8

\* Cf. Krypton II. 5143.25.

## SECOND XENON SPECTRUM—continued.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
4884.36	1	4884 (4)		1.34	5.6	20467.9
83.68	6	4883 (not given)		"	"	71.2
76.68	7	4876 (4)		1.33	"	20500.2
69.60	3			"	"	30.0
62.69	8			"	"	59.2
* 57.37	1			"	"	20582.1
53.90	2			"	"	95.4
44.50	10	4844 (10)	4844.58 (as a weak krypton line)	"	"	20636.4
32.16	2			1.32	"	89.0
29.23	1	4830 (1)		"	"	20701.5
25.23	1			"	"	18.8
23.47	6	4823 (3)		"	"	26.4
18.15	4			"	5.7	49.1
17.30	1			"	"	52.8
* 07.19	1	4807 (1)		"	"	96.5
4796.66	1n			1.31	"	20842.1
94.61	2 }	4793 (1)		"	"	51.1
92.72	1 }			"	"	59.3
87.95	4	4787 (2)		"	"	80.1
86.83	1n			"	"	85.0
79.33	1	4779 (2)		"	5.8	20917.6
75.85	1			"	"	32.9
75.33	1			"	"	35.2
73.34	2n			"	"	43.9
69.21	4	4769 (2)		"	"	62.0
57.48	1			1.30	"	21013.7
49.10	3			"	"	50.8
44.04	1			"	"	73.3
		4740 (not seen)				
* 34.30	1	4734 (1)		"	"	21116.6
32.53	1			"	"	24.5
31.35	3n	4731 (1)		"	"	30.8
23.74	2	4723 (1)		1.29	"	63.9
15.31	3 }			"	"	21201.7
12.78	3 }	4714 (1)		"	"	14.1
4698.20	5	4698 (3)		"	5.9	78.8
93.50	< 1			"	"	21300.2
83.76	5			1.28	"	44.5
77.00	1n			"	"	75.3
76.61	3n			"	"	77.1
74.78	3			"	"	85.5
73.91	4			"	"	89.5
72.40	2			"	"	96.4
71.88	1			"	"	98.8
* 71.41	2			"	"	21400.9
68.72	3			"	"	13.2
66.48	2n			"	"	23.5
59.10	1			"	"	57.5

\* Cf. first Xenon spectrum.



## SECOND XENON SPECTRUM—continued.

Wave-length	Intensity and Character	Living and Dewar	Range	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
*4658·06	3			1·28	5·9	21462·3
53·23	3			1·27	"	84·5
52·15	6	4652 (4)		"	"	89·5
41·64	2			"	"	21538·2
37·42	1			"	"	57·8
33·49	3	4634 (2)		"	6·0	76·0
32·83	< 1			"	"	79·1
31·67	1n			"	"	84·5
† 24·47	2n	4624 (2)		"	"	21618 1
20·60	< 1			"	"	36·2
17·66	2n			1·26	"	50·0
15·72	5	4616 (3)		"	"	59·1
03·21	10	4602 (8)		"	"	21718·0
00·20	1n			"	"	32·2
4593·90	1			"	"	62·0
92·22	6n	4592 (3)		"	"	70·0
85·65	10	4586 (5)		"	"	21801·2
80·81	1n			1·25	"	24·2
† 77·36	6	4577 (3)	4577·31 (as krypton line)	"	"	40·7
72·16	1n			"	"	65·5
71·85	1n			"	"	67·0
69·29	1			"	"	79·2
56·08	3n	4556 (2)		"	6·1	21942·1
50·90	1			"	"	67·6
45·34	8	4545 (3)		"	"	94·5
41·03	8	4541 (3)		1·24	"	22015·3
37·51	3			"	"	32·4
37·02	1	4535 (2)		"	"	34·8
32·67	5			"	"	56·0
24·38	5	4525 (5)		"	"	96·4
21·98	3n	4522 (1)		"	"	22108·1
07·32	1			"	"	80·0
03·64	2			1·23	"	98·2
† 01·14	2	4500 (1)		"	"	22208·5
86·12	2	4486 (1)		"	6·2	84·8
81·01	7n	4481 (5)		"	"	22310·2
74·10	< 1n			"	"	44·7
72·12	< 1	4471 (1)		"	"	54·6
68·34	< 1			1·22	"	73·5
62·38	20	4462 (10)		"	"	22403·4
60·75	< 1			"	"	11·6
53·81	3			"	"	46·5
48·28	10	4449 (6)		"	"	74·4
41·08	3n	4440 (1)		"	"	22510·8
34·35	6	4434 (2)		"	"	45·9
18·10	2			1·21	6·3	22627·9
16·21	3n			"	"	37·5
15·00	7	4415 (8)		"	"	43·8
13·23	3			"	"	52·8
06·99	5n	4407 (3)		"	"	84·9

\* Cf. Argon blue spectrum 4658·08 (Kayser).

† Cf. Krypton II. 4857·36, 4577·40 (6).

‡ Cf. first Xenon spectrum.

SECOND XENON SPECTRUM—*continued.*

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda}$	
4395.91	10	4396 (4)		1.21	6.3	22742.1
95.30	1			"	"	45.4
93.34	10	4393 (4)		1.20	"	55.4
87.65	1			"	"	84.9
86.19	1	4386 (3)	{	"	"	92.5
85.08	3			"	"	98.3
73.87	3n	4375 (4)		"	"	22856.7
69.34	4	4369 (4)		"	"	80.4
67.15	1n			"	6.4	91.9
		* 4356				
		4343 (1)				
		(not seen)				
37.14	2n	4337 (3)		1.19	"	23050.3
35.95	1			"	"	56.6
30.63	15	4331 (10)		"	"	84.9
21.95	4	4322 (3)		"	"	23131.3
10.69	2n	4311 (3)	{	1.18	"	91.7
10.54	2n					
09.46	2			"	"	92.5
08.16	3			"	6.5	98.3
05.99	< 1			"	"	23205.3
4296.97	< 1			"	"	65.7
96.52	5	4297 (3)		"	"	68.1
93.85	2			"	"	82.6
86.86	1			"	"	23320.6
86.04	4	4286 (3)		"	"	25.1
72.74	4	4272 (3)		1.17	"	97.7
70.00	3	4269 (3)		"	"	23412.7
67.97	< 1			"	"	23.8
		4263 (not seen)				
51.68	4n	4251 (3)		"	6.6	23513.5
45.54	10	4245 (10)	{	"	"	47.5
44.56	4			"	"	53.0
44.04	1			"	"	57.9
40.41	3			1.16	"	76.0
38.37	10	4239 (8)		"	"	87.4
27.12	2	4227 (1)		"	"	23650.2
23.14	5n	4223 (5)		"	"	72.5
16.88	1			"	"	23707.6
15.77	5	4215 (10)	{	"	"	13.8
14.85	1			"	"	19.0
14.17	5			"	"	22.9
13.80	5	4214 (6)		"	"	24.9
09.75	4	4209 (8)	{	"	"	47.8
09.53	4			"	"	49.0
08.61	6			"	"	53.2
04.06	2	4204 (1)		1.15	"	79.9
03.35	1			"	"	83.9
01.38	1	4201 (1)		"	"	95.1
4197.92	1	4198 (1)		"	6.7	23814.6
96.85	< 1			"	"	20.7
95.02	2			"	"	31.1

\* No doubt the Krypton II. line 4355.67, which is easily visible in Xenon when only small traces are present.

SECOND XENON SPECTRUM—*continued.*

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
4193.25	8	4193 (6)		1.15	6.7	23841.1
81.28	< 1			"	"	23909.4
80.20	10	4181 (10)		"	"	15.6
79.83	1			"	"	17.7
76.65	3	4176 (1)		"	"	35.9
71.08	1n	4172 (1)		"	"	67.9
62.25	3	4163 (3)		1.14	"	24018.8
58.14	5	4159 (3)		"	"	42.5
56.27	< 1n			"	"	53.3
55.70	< 1			"	"	56.6
54.76	1			"	"	61.8
52.12	1			"	"	77.4
45.85	5	4146 (3)		"	6.8	24113.7
42.12	2	4142 (1)		"	"	35.4
33.08	1			"	"	88.2
32.52	1 }	4132 (2)		"	"	91.5
31.11	1 }			"	"	99.8
22.01	1	4121 (1)		1.13	"	24253.2
13.34	< 1			"	"	24304.3
12.25	2n	4112 (2)		"	"	10.8
10.53	1			"	"	21.0
10.18	1			"	"	23.0
09.20	6	4109 (6)		"	"	28.8
06.25	1 }	4106 (3)		"	"	46.3
05.10	2 }			"	"	53.1
03.19	1			"	"	65.5
00.48	2	4100 (2)		"	"	80.6
4099.01	4	4099 (3)		"	6.9	89.2
95.04	3	4093 (1)		"	"	24412.9
87.38	< 1			1.12	"	58.7
83.48	< 1n			"	"	82.0
83.07	< 1			"	"	84.5
82.79	2			"	"	86.1
78.85	2	4079 (1)		"	"	24509.8
78.33	1n			"	"	12.9
73.62	1			"	"	41.3
72.62	4n	4074 (1)		"	"	47.3
70.30	1			"	"	61.3
66.67	1			"	"	83.2
62.27	< 1			"	"	24609.9
61.30	1			"	"	16.8
61.06	2			"	"	17.2
60.60	3	4060 (1)		"	"	20.0
57.55	5n	4058 (6)		"	"	38.5
56.22	< 1n			"	"	46.6
53.75	2			1.11	"	61.6
51.79	1			"	"	73.5
51.36	< 1n			"	7.0	76.1
50.19	6	4050 (6)		"	"	83.2
47.45	1n			"	"	99.9
* 46.29	1			"	"	24707.0
44.96	2 }	4044 (1)		"	"	15.1
44.09	1 }			"	"	20.4

\* Cf. Krypton II. 4046.30.

## SECOND XENON SPECTRUM—continued.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
4043.73	< 1			1.11	7.0	24722.6
43.38	3	4043 (1)		"	"	24.8
39.39	< 1			"	"	49.2
37.70	2	4037 (6)	{	"	"	59.6
37.43	3			"	"	61.2
33.02	< 1			"	"	88.3
30.69	2			"	"	24802.6
28.72	3	4029 (1)		"	"	14.8
28.10	3			"	"	18.6
25.32	1	4025 (3)		"	"	35.7
21.76	1	4021 (1)		"	"	57.7
18.05	1			"	"	80.7
14.27	1			1.10	"	24904.2
03.71	< 1			"	"	69.8
02.51	2	4002 (3)		"	7.1	77.2
01.32	1			"	"	84.1
00.66	1			"	"	88.8
3998.67	1n			"	"	25001.2
97.18	< 1			"	"	10.5
94.55	1	3994 (2)		"	"	27.0
92.98	5	3991 (3)		"	"	36.9
90.40	3n			"	"	53.0
86.10	3	3986 (1)		"	"	80.1
81.69	2	3981 (1)		"	"	25107.9
79.35	2			"	"	22.6
76.47	1	3975 (1)	{	"	"	40.8
75.73	< 1			1.09	"	45.5
74.14	< 1			"	"	55.6
72.69	2n	3973 (2)		"	"	64.8
70.04	1			"	"	81.6
65.59	1			"	"	25209.8
		3957 (not seen)				
		3955 (not seen)				
51.73	< 1			"	7.2	98.2
50.70	8	3951 (6)		"	"	25304.8
43.73	3	3944 (3)		"	"	49.5
* 42.29	1			"	"	58.7
39.05	2	3939 (1)		"	"	79.6
32.63	2			1.08	"	25421.1
29.73	1			"	"	39.8
		3926 (not seen; possibly Argon, 3925.90)				
23.56	2n	3923 (6)	{	"	"	79.9
22.67	10			"	"	85.6
18.71	3			"	"	25511.4
17.28	1n			"	"	20.7
15.46	3	3915 (1)		"	"	32.6
12.23	< 1			"	"	53.7
11.77	1			"	"	56.7
08.00	7	3908 (4)		"	"	81.3

\* Cf. Krypton II. 3942.28 (1).



SECOND XENON SPECTRUM—*continued.*

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
3906.02	3	3906 (1)		1.08	7.3	25594.2
05.71	1			"	"	96.2
03.82	2	3903 (1)		"	"	25608.6
03.30	1			"	"	12.0
3897.88	1			"	"	47.7
95.18	6	3894 (3)		1.07	"	65.4
94.17	< 1			"	"	72.1
93.59	< 1			"	"	75.9
92.51	1			"	"	83.1
91.73	1			"	"	88.2
87.14	1			"	"	25718.6
86.88	2			"	"	20.3
85.54	1			"	"	29.1
85.15	4	3885 (3)		"	"	31.7
82.81	1			"	"	47.2
80.60	6	3880 (3)		"	"	61.9
79.35	1			"	"	70.2
77.95	8	3877 (3)		"	"	79.5
77.12	1			"	"	85.0
69.79	2	3870 (2)		"	"	25833.9
66.80	1 <sub>n</sub>			"	"	53.9
62.71	< 1			"	"	81.3
61.19	4	3862 (2)		"	"	91.5
58.67	2	3858 (2)		"	"	25908.3
56.20	< 1			1.06	"	24.9
54.44	4	3855 (1)		"	"	36.8
49.97	3 <sub>n</sub>	3850 (2)		"	"	66.9
48.75	2	3849 (1)		"	"	75.2
47.57	2			"	"	83.1
46.43	1			"	"	90.8
42.05	5 }	3842 (4)		{ "	"	26020.5
41.68	7 }					27.0
39.13	1					40.3
37.87	1			"	"	48.8
29.90	1 }	3829 (1)		{ "	"	26103.0
28.49	2 }					12.7
28.15	1			"	"	15.3
* 26.99	2	3826 (1)		"	"	22.9
26.33	1			"	"	27.4
23.34	1	3824 (1)		"	"	47.8
16.93	1			1.05	7.4	91.7
15.32	1	3815 (1)		"	"	26202.8
11.93	1			"	"	26.0
11.19	4	3811 (3)		"	"	31.1
08.14	1			"	"	52.1
07.42	1	3807 (1)		"	"	57.1
01.86	2 }	3801 (1)		{ "	"	95.5
01.13	1 }					26300.6
3792.46	1			"	"	60.7
91.82	5	3792 (1)		"	"	65.2
87.46	1	3787 (1)		"	"	95.5
		† 3783				
81.13	10	3781 (6)		"	"	26439.7

\* Cf. Xenon I.

† Probably 3783.28 Krypton II.

## SECOND XENON SPECTRUM—continued.

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
3776.46	7	3776 (3)		1.04	7.4	26472.5
74.38	< 1			"	"	87.0
72.68	5	3773 (1)		"	7.5	98.8
71.05	1	3770 (1)		"	"	26510.0
* 68.08	1			"	"	31.2
* 65.99	4	3766 (1)		"	"	45.9
63.52	2	3763 (2)		"	"	63.4
62.43	4	3762 (1)		"	"	71.2
58.13	1			"	"	26601.5
57.03	1	3757 (1)		"	"	09.3
56.14	1			"	"	13.6
* 51.80	1			"	"	46.4
50.86	4			"	"	53.0
45.85	5	3746 (3)		"	"	88.7
38.04	3	3737 (1)		"	"	26744.5
36.15	1			1.03	"	58.0
31.33	1	3731 (2)		{	"	92.6
30.29	3				"	26800.1
28.33	1			"	7.6	14.1
27.45	1			"	"	20.4
20.93	4	3721 (2)		"	"	67.4
		3717 (not seen) †				
† 15.73	1			"	"	26905.0
12.04	3	3712 (2)		{	"	31.8
11.78	2				"	33.6
09.88	1			"	"	47.4
09.07	2			"	"	52.3
08.29	3	3708 (1)		"	"	59.0
06.32	1			"	"	72.3
3698.87	1			"	"	27027.7
92.75	< 1			1.02	"	72.5
89.96	1	3689 (1)		"	"	93.0
76.75	7	3677 (3)		"	7.7	27190.2
72.68	2	3673 (2)		"	"	27220.4
69.28	5			"	"	45.7
66.90	5			"	"	63.3
65.26	1			"	"	75.5
64.60	1			"	"	80.4
64.05	3	3664 (1)		"	"	84.5
62.99	1			"	"	92.4
62.44	1			"	"	96.5
61.79	2	3662 (2)		"	"	27301.3
58.97	< 1			"	"	22.4
58.59	1	3658 (1)		{	"	25.2
58.32	< 1				"	27.2
57.88	1			1.01	"	30.5
54.75	5	3655 (2)		"	"	53.9
53.27	2			"	"	65.3
49.71	4	3650 (1)		"	"	91.7
48.47	2			"	"	27401.0

\* Cf. Krypton II. 3768.10 (1), 3765.98 (1), 3751.81 (1).

† Possibly Argon 3717

‡ Cf. Argon 3715.

## SECOND XENON SPECTRUM—continued.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
3646.83	< 1			1.01	7.7	27411.4
45.05	2			{	"	26.8
44.58	2	3645 (6)				30.3
44.29	2					32.5
41.15	4	3641 (2)				56.1
36.17	2			"	7.8	93.7
35.49	1			"	"	98.8
34.34	1			"	"	27507.5
33.87	ln			"	"	11.1
32.30	4	3632 (2)		"	"	23.0
31.44	1			"	"	29.5
28.69	2			"	"	50.4
24.21	8	3624 (10)		{	"	84.4
23.28	5					91.5
21.75	1					27603.2
20.18	2			"	"	16.1
19.03	2			"	"	23.9
16.02	3	3616 (1)		1.00	"	46.9
14.59	1			"	"	57.8
12.52	3	3613 (4)		"	"	73.7
12.16	1			"	"	76.5
09.60	5	3610 (2)		"	"	96.1
07.58	1			{	"	27711.6
07.17	5	3607 (4)				14.9
06.22	3					22.1
02.03	2	3602 (1)		{	"	54.3
01.21	3					60.6
3596.75	5	3597 (3)		"	"	95.1
95.53	2			"	"	27804.4
93.61	1			"	7.9	19.3
92.14	1			"	"	30.7
91.34	1			"	"	36.9
89.40	< 1			"	"	51.9
87.84	2			"	"	64.0
87.45	1			"	"	66.2
84.68	1			"	"	88.6
83.79	6	3584 (8)		"	"	95.5
79.85	6	3580 (8)		"	"	27926.2
78.71	1			"	"	35.1
78.14	1			"	"	39.6
76.80	5			0.99	"	50.0
75.08	1			"	"	63.5
74.56	1			"	"	67.6
74.26	1			"	"	69.9
70.31	1			"	"	28000.9
69.67	1			"	"	05.9
65.35	4	3565 (8)		{	"	39.8
* 64.40	4					47.3
63.15	1					57.1
62.37	3			"	"	63.3
61.53	3			"	"	68.9
58.12	1			"	"	96.8
56.64	2	3556 (3)		"	"	28108.5

\* Cf. Krypton II. 3564.38 (4).

SECOND XENON SPECTRUM—*continued.*

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
3556.00	1			0.99	7.9	28113.6
54.60	1			"	"	24.7
53.42	1			"	"	34.0
52.29	6	3553 (5)		"	"	43.0
50.21	1			"	8.0	59.5
49.39	1			"	"	65.9
48.35	1			"	"	74.1
47.04	1			"	"	84.5
45.04	2			"	"	28200.4
42.50	6	3543 (6)		"	"	20.6
40.09	3			"	"	39.9
37.56	3			0.98	"	60.1
33.39	1			"	"	93.4
31.93	1			"	"	28305.1
31.43	1			"	"	09.1
30.76	1			"	"	14.5
30.40	1			"	"	17.4
28.14	1			"	"	35.5
27.39	1			"	"	41.6
26.04	< 1			"	"	52.3
22.98	5	3523 (4)		"	"	77.0
19.26	3			"	"	28407.1
18.12	1			"	"	16.3
16.92	1			"	"	26.0
16.38	1			"	"	30.3
15.53	1			"	"	37.2
13.72	3			"	"	51.9
11.83	1			"	"	67.2
11.60	1			"	"	69.0
09.05	1	3510 (2)		"	8.1	89.6
06.74	1			"	"	28508.4
03.99	1	3504 (1)		"	"	30.8
01.86	3	3501 (4)		{	"	48.1
00.53	2				"	59.0
3498.33	1			0.97	"	77.0
98.04	4			"	"	79.3
95.00	1			"	"	28604.2
94.69	2			"	"	06.7
88.34	1			"	"	58.8
83.39	1			"	"	99.6
79.82	1			"	"	28729.0
79.29	1			"	"	33.4
75.43	1			"	"	65.3
74.42	1			"	"	73.7
72.59	3			"	"	88.9
71.47	1			"	"	98.1
70.73	1			"	8.2	28804.2
70.27	1			"	"	08.0
69.31	1			"	"	16.0
68.35	5	3468 (2)		{	"	24.0
67.37	5				"	32.1
63.63	< 1			"	"	63.2
62.69	< 1			"	"	71.1
61.44	3	3461 (1)		"	"	81.5
58.90	6			0.96	"	28902.7



SECOND XENON SPECTRUM—*continued*.

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
3455·87	1	3454 (1)		0·96	8·2	28928·1
54·41	7			"	"	40·3
52·13	1			"	"	59·4
50·86	1			"	"	70·1
50·19	1			"	"	75·7
46·52	1			"	"	29006·6
45·01	1			"	"	19·2
44·61	1			"	"	22·7
44·38	4			"	"	24·6
43·49	1			"	"	32·1
42·08	ln			"	"	44·0
40·91	ln			"	"	53·9
38·88	ln			"	"	71·0
38·28	1			"	"	76·1
37·96	1			"	"	78·8
37·68	2			"	"	81·2
35·91	2			"	"	96·2
35·17	1			"	"	29102·4
32·18	1			"	8·3	27·7
31·71	4			"	"	31·7
30·62	1			"	"	41·0
29·13	1	*		"	"	53·6
28·95	1			"	"	55·2
28·61	1			"	"	58·0
28·20	1			"	"	61·5
26·61	1			"	"	75·1
24·88	1			"	"	89·8
20·89	4			"	"	29223·9
18·11	< 1			"	"	47·6
13·34	ln			0·95	"	88·5
09·60	< ln			"	"	29320·1
07·76	1			"	"	36·5
07·25	1			"	"	40·9
05·62	1			"	"	54·9
04·06	3			"	"	68·4
00·02	1			"	"	29403·6
3397·65	1			"	"	23·8
† 96·72	2			"	"	31·9
95·68	1			"	8·4	40·9
94·92	2			"	"	47·4
92·73	4			"	"	66·4
90·78	3			"	"	83·3
90·13	1			"	"	89·0
† 87·26	1	†		"	"	29514·0
86·89	4			"	"	17·2
85·85	1			"	"	26·3
84·28	3			"	"	40·0
84·07	2			"	"	41·8
81·81	1			"	"	61·6
80·24	3			"	"	75·3
† 79·20	2			"	"	84·4
77·17	1			0·94	"	29602·2

\* Cf. Krypton II. 3428·95 (1).

† Cf. Krypton II. 3396·72 (2), 3387·26 (1), 3379·18 (1).

## SECOND XENON SPECTRUM—continued.

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda}$	
3374.11	1			0.94	8.4	29629.0
70.81	1			"	"	58.1
67.64	1			"	"	86.0
66.87	3n			"	"	92.8
64.82	1			"	"	29710.9
63.64	1			"	"	21.3
62.93	1			"	"	27.6
* 60.20	2			"	8.5	51.6
58.13	4			"	"	70.1
56.09	2			"	"	88.1
54.51	1			"	"	29802.1
50.53	1n			"	"	37.7
49.91	3			"	"	43.1
45.11	1			"	"	85.9
44.41	1			"	"	92.1
40.85	1			"	"	29923.9
40.54	3			"	"	26.8
40.23	2			"	"	29.6
39.67	1			"	"	34.6
39.37	1			"	"	37.3
39.17	3			"	"	39.1
39.00	2			"	"	40.6
34.38	1			0.93	"	82.1
32.97	5			"	"	94.8
31.80	5			"	"	30005.3
* 30.90	6			"	"	13.4
28.45	1			"	"	35.7
27.64	1			"	"	42.8
22.30	6			"	8.6	91.0
20.21	2			"	"	30110.0
19.69	1			"	"	14.7
19.15	1			"	"	19.6
18.76	1			"	"	23.1
17.59	1			"	"	33.8
16.47	1			"	"	43.9
† 15.80	1			"	"	50.0
15.00	1			"	"	57.3
14.41	1			"	"	62.7
13.64	1n			"	"	69.7
13.01	1			"	"	75.4
12.34	< 1			"	"	81.5
11.95	< 1			"	"	85.1
10.52	5			"	"	98.2
06.94	3			"	"	30230.8
06.04	4			"	"	35.1
04.19	2			"	"	56.0
03.47	2			"	"	62.6
01.65	3			"	"	79.3
00.38	1n			"	"	90.9
3298.85	1			0.92	"	30305.0
98.06	< 1			"	"	12.3
96.07	4			"	"	30.6

\* Cf. Krypton II. 3360.22 (2), 3330.88 (7).

† Cf. Krypton II. 3315.80 (1).

SECOND XENON SPECTRUM—*continued.*

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
3295.63	2			0.92	8.6	30334.6
94.70	< 1n			"	"	43.2
94.09	1			"	"	48.8
93.17	< 1			"	"	57.3
91.72	1n			"	"	70.7
90.44	< 1			"	"	82.5
88.03	5			"	8.7	30404.6
86.17	1			"	"	21.9
85.93	8			"	"	24.1
84.81	1			"	"	34.5
83.75	< 1n			"	"	44.3
81.36	1			"	"	66.5
80.94	< 1			"	"	70.4
80.66	4			"	"	73.0
79.31	< 1			"	"	85.5
78.61	3			"	"	92.0
77.41	3			"	"	30503.2
76.55	3			"	"	11.2
75.07	2			"	"	25.0
73.89	3			"	"	36.0
73.06	3			"	"	43.7
71.35	1			"	"	59.7
69.57	< 1			"	"	76.4
69.11	5			"	"	80.7
68.31	2			"	"	88.2
67.52	1			"	"	95.5
67.19	4			"	"	98.6
66.21	1			"	"	30607.8
64.76	4			"	"	21.4
62.18	1			"	"	45.6
60.81	< 1			"	"	58.5
60.42	< 1			"	"	62.2
59.57	4			0.91	"	70.1
58.04	1			"	"	84.6
56.79	3			"	"	96.4
56.39	3			"	"	30700.1
53.38	5			"	"	28.6
50.70	3			"	8.8	53.9
49.14	< 1			"	"	69.3
48.98	< 1			"	"	70.2
48.76	1			"	"	72.2
47.80	5			"	"	81.3
46.99	4			"	"	89.0
45.17	< 1			"	"	30806.2
44.30	3			"	"	14.5
42.98	7			"	"	27.0
41.26	1			"	"	43.4
39.41	6			"	"	61.0
37.50	1			"	"	79.2
36.97	5			"	"	84.3
35.85	4			"	"	95.0
35.49	< 1			"	"	98.4
34.69	1			"	"	30906.1
34.36	1			"	"	09.2
33.56	< 1			"	"	16.9

SECOND XENON SPECTRUM—*continued.*

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
3233.39	1			0.91	8.8	30918.5
31.83	5			"	"	33.5
30.80	< 1			"	"	43.3
30.12	1			"	"	49.8
29.21	1			"	"	58.5
27.32	4			"	"	76.7
25.65	4			"	"	92.7
25.26	2			"	"	96.4
23.91	1			"	"	31009.4
23.52	2			"	"	13.2
23.14	4			"	"	16.8
* 22.40	1			"	"	24.0
21.45	1			"	"	33.1
21.18	2			"	"	35.8
19.97	< 1			0.90	"	47.4
18.13	< 1			"	"	65.1
16.92	< 1n			"	"	76.8
14.66	1			"	8.9	98.6
14.30	4			"	"	31102.1
12.68	< 1			"	"	17.8
12.46	1			"	"	19.9
10.40	3			"	"	39.9
09.54	4			"	"	48.2
06.49	1			"	"	77.8
06.21	< 1			"	"	80.6
02.81	1			"	"	31213.7
02.17	2			"	"	19.9
01.94	< 1			"	"	22.2
01.67	3			"	"	24.8
3199.87	1			"	"	42.3
99.39	1			"	"	47.1
98.75	4			"	"	53.3
96.68	3			"	"	73.6
96.37	5			"	"	76.6
95.10	< 1			"	"	89.0
93.86	< 1			"	"	31301.2
93.35	2			"	"	06.2
88.80	< 1			"	"	50.9
87.91	< 1			"	"	59.6
87.60	2			"	"	62.7
86.93	1			"	"	69.3
85.93	< 1			"	"	79.1
85.35	5			"	"	84.8
84.74	3			"	"	90.8
84.42	2			0.89	"	94.0
81.57	1			"	"	31422.0
80.62	< 1			"	9.0	31.4
79.40	5			"	"	43.5
77.27	2			"	"	64.6
76.18	3			"	"	75.4
† 75.80	3			"	"	79.1
75.38	5			"	"	83.3
73.15	1n			"	"	31505.4

\* Cf. Krypton II. 3222.40 (1).

† Cf. Krypton II. 3175.78 (2).



SECOND XENON SPECTRUM—*continued.*

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
3170·81	1			0·89	9·0	31528·7
68·77	< 1			"	"	49·0
67·67	< 1			"	"	59·9
66·92	< 1			"	"	67·4
66·26	1			"	"	74·0
64·63	2			"	"	90·3
64·43	1			"	"	92·3
63·10	2			"	"	31605·6
60·82	2			"	"	28·4
59·97	1			"	"	36·9
56·85	2			"	"	68·5
55·66	3			"	"	80·1
53·58	3			"	"	31701·0
53·14	4			"	"	05·4
51·98	5			"	"	17·1
51·11	6			"	"	25·8
50·86	6			"	"	28·4
49·11	1			"	"	46·0
48·17	1n			"	"	55·5
46·84	< 1			"	9·1	68·8
45·17	1			"	"	85·7
43·77	2			"	"	99·8
42·69	1			"	"	31810·8
41·77	2			0·88	"	20·1
39·21	1			"	"	46·0
38·87	1			"	"	49·5
38·46	6			"	"	53·7
34·86	1			"	"	90·3
32·87	1			"	"	31910·5
30·48	2n			"	"	34·9
26·90	1			"	"	71·5
* 25·86	2			"	"	82·1
25·12	< 1			"	"	89·7
24·75	1			"	"	93·5
24·15	1			"	"	99·6
22·32	1			"	"	32018·4
22·00	8			"	"	21·7
21·15	1			"	"	30·4
19·34	1			"	"	49·0
16·88	1			"	"	74·3
14·56	4			"	9·2	98·2
13·69	< 1			"	"	32107·0
12·87	3			"	"	15·5
08·72	1n			"	"	58·4
07·91	2n			"	"	76·8
06·50	5			"	"	81·4
05·75	1			"	"	89·1
04·60	3			"	"	32201·1
03·64	2			"	"	11·0
03·38	< 1			"	"	13·7
02·88	1			"	"	18·9
02·54	< 1			"	"	22·4
01·68	2n			0·87	"	31·4

SECOND XENON SPECTRUM—*continued.*

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda}$	
3100.04	3			0.87	9.2	32248.4
3098.68	1			"	"	62.6
98.33	1			"	"	66.2
97.03	1			"	"	79.8
94.91	1			"	"	32301.9
94.69	2			"	"	04.2
93.55	1 <sub>n</sub>			"	"	16.1
92.57	2			"	"	26.4
91.22	5			"	"	40.7
90.15	3			"	"	51.7
89.07	1			"	"	63.0
85.74	< 1			"	"	97.9
83.70	6			"	9.3	32419.3
83.05	1			"	"	26.1
82.74	2			"	"	29.4
80.61	3			"	"	51.8
79.86	4			"	"	59.8
77.82	1			"	"	81.2
75.47	1			"	"	32506.1
73.62	4			"	"	25.6
73.31	1			"	"	28.9
71.49	3			"	"	48.2
70.19	2			"	"	62.0
68.71	1			"	"	77.7
67.43	4			"	"	91.3
66.69	1			"	"	99.1
65.33	6			"	"	32613.6
63.49	2			"	"	33.2
61.71	3			0.86	"	52.2
57.16	< 1			"	"	32700.8
56.63	3			"	"	06.5
55.42	2			"	"	19.4
54.62	4			"	"	28.0
51.41	1			"	9.4	62.4
51.14	1			"	"	65.2
49.04	1			"	"	87.8
48.31	1			"	"	95.7
47.93	1 <sub>n</sub>			"	"	99.6
46.40	3			"	"	32816.2
45.42	3			"	"	32.3
* 44.91	2			"	"	41.69
44.36	2			"	"	38.2
42.22	3			"	"	61.3
37.47	1			"	"	32912.5
37.00	2 <sub>n</sub>			"	"	17.8
34.36	3			"	"	46.5
33.86	1			"	"	51.9
33.22	2			"	"	58.9
32.63	< 1			"	"	65.3
31.97	1 <sub>n</sub>			"	"	72.5
29.91	2			"	"	94.9
29.05	1 <sub>n</sub>			"	"	33004.2
28.49	< 1			"	"	10.4

\* Cf. Krypton II. 3044.92 (1).

SECOND XENON SPECTRUM—*continued.*

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
3027.77	1			0.86	9.4	33018.2
27.41	1			"	"	22.1
26.66	3			"	"	30.3
23.99	5			"	9.5	59.4
23.83	5			"	"	61.1
20.47	1			0.85	"	97.9
19.96	< 1			"	"	33103.5
17.89	< 1			"	"	26.2
17.68	4			"	"	29.6
15.91	1			"	"	48.0
15.67	2			"	"	51.7
14.77	3			"	"	60.5
14.32	2			"	"	65.5
13.53	1			"	"	74.2
13.05	< 1			"	"	79.5
12.45	< 1			"	"	86.1
11.44	< 1			"	"	97.2
10.85	3			"	"	33203.7
09.16	3			"	"	22.4
04.81	1			"	"	70.8
04.48	4			"	"	74.1
04.11	3			"	"	78.2
02.01	3			"	"	33301.5
01.70	3			"	"	05.0
00.12	< 1			"	"	22.5
2999.44	2			"	"	30.1
99.24	2 <sub>n</sub>			"	"	32.3
97.69	2			"	"	49.5
95.11	1			"	9.6	78.2
94.86	2			"	"	83.2
93.07	5			"	"	33400.9
91.91	< 1			"	"	13.9
91.65	2			"	"	16.8
91.42	3			"	"	19.3
90.74	1			"	"	26.9
90.48	1			"	"	29.9
87.00	2			"	"	57.6
86.32	3			"	"	76.4
85.72	4			"	"	83.2
84.77	4			"	"	93.8
82.39	3			0.84	"	33520.6
81.47	2			"	"	30.9
80.26	< 1			"	"	44.5
79.48	6			"	"	53.3
76.95	< 1			"	"	81.8
76.58	3			"	"	86.0
74.97	2			"	"	33604.2
73.65	3			"	"	19.1
72.48	1			"	"	32.3
71.40	2			"	"	44.6
71.08	1			"	"	48.2
70.65	3			"	9.7	53.0
70.29	1			"	"	57.0
69.95	2			"	"	60.9
69.63	1			"	"	64.5

## SECOND XENON SPECTRUM—continued.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
2969.42	1			0.84	9.7	33666.9
68.74	3			"	"	74.6
67.11	3			"	"	93.1
65.13	3			"	"	33715.6
64.35	3			"	"	24.5
63.59	3			"	"	33.1
61.69	1			"	"	53.4
* 60.93	2			"	"	63.5
60.53	3			"	"	68.0
59.55	4			"	"	79.2
57.77	5			"	"	99.5
56.05	1			"	"	33819.2
55.08	< 1			"	"	30.3
54.84	1			"	"	33.1
54.27	3			"	"	39.6
54.08	1			"	"	41.8
51.73	1			"	"	68.7
50.91	< 1			"	"	78.1
49.88	2 <sub>n</sub>			"	"	90.0
48.23	4			"	"	33908.9
47.69	5			"	"	15.2
46.52	1			"	"	28.6
45.71	2			"	"	38.0
45.41	5			"	9.8	41.4
44.78	1			"	"	48.6
43.59	2			"	"	62.3
43.07	1			"	"	68.3
42.25	4			0.83	"	77.8
41.55	3			"	"	86.0
40.37	5			"	"	99.5
39.89	3			"	"	34005.1
39.29	4			"	"	12.0
38.38	< 1			"	"	22.5
37.61	< 1			"	"	31.5
36.03	0			"	"	49.8
34.98	1			"	"	62.0
32.92	4			"	"	85.9
32.27	3			"	"	93.5
30.44	5			"	"	34114.8
29.41	1			"	"	26.8
28.20	< 1			"	"	40.9
27.74	< 1			"	"	46.2
27.30	1			"	"	51.4
26.27	4			"	"	63.4
25.58	< 1			"	"	71.5
25.11	< 1			"	"	77.0
24.56	1			"	"	83.4
24.12	3			"	"	88.5
23.68	4			"	"	93.7
22.62	< 1			"	"	34206.1
22.10	< 1			"	"	12.2
21.74	< 1			"	"	16.4
20.05	3			"	9.9	36.1

\* Cf. Krypton II. 2960.93 (2).



SECOND XENON SPECTRUM—*continued*.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
2918.74	< 1			0.83	9.9	34251.5
17.76	4			"	"	63.0
16.81	3			"	"	74.1
15.87	< 1			"	"	95.2
15.22	1			"	"	92.8
14.28	4			"	"	34303.9
12.56	5n			"	"	24.1
12.06	5			"	"	30.0
11.63	1			"	"	35.1
11.38	< 1			"	"	38.1
10.54	1			"	"	48.0
07.35	4			"	"	85.7
06.71	5			"	"	93.3
05.26	< 1n			"	"	34410.4
04.79	< 1			"	"	16.0
04.32	1			"	"	21.6
02.84	1			0.82	"	39.1
02.47	1			"	"	43.5
00.59	1			"	"	65.8
2899.56	< 1			"	"	78.1
98.97	< 1			"	"	85.1
98.65	1			"	"	88.9
98.19	1			"	"	94.4
97.85	1			"	"	98.4
96.79	4			"	10.0	34511.0
96.20	< 1			"	"	18.0
95.40	4			"	"	27.5
91.86	4			"	"	69.8
90.81	< 1			"	"	82.4
90.14	2			"	"	90.4
89.22	2			"	"	34601.4
88.74	< 1			"	"	07.2
87.29	2			"	"	24.5
86.86	3			"	"	29.7
84.39	< 1			"	"	59.4
83.89	2			"	"	65.4
79.94	1			"	"	34712.9
77.87	1			"	"	37.8
73.65	2			"	"	88.9
72.91	1			"	"	97.9
71.85	4			"	10.1	34810.7
71.43	3			"	"	15.8
71.27	5			"	"	17.7
69.71	< 1			"	"	36.6
68.61	1			"	"	48.8
67.55	1			"	"	62.9
66.96	1			"	"	70.0
64.92	4n			0.81	"	94.9
64.32	1			"	"	34902.2
64.00	< 1			"	"	06.1
62.56	3			"	"	23.7
62.06	1			"	"	29.8
58.03	1			"	"	79.0
57.29	< 1n			"	"	88.1
56.80	1			"	"	94.1

SECOND XENON SPECTRUM—*continued*.

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda}$	
2855.92	1			0.81	10.1	35004.9
55.42	< 1			"	"	11.0
54.70	4n			"	"	19.9
53.78	1			"	"	31.2
53.28	< 1			"	"	37.3
52.55	2n			"	"	58.5
51.10	1			"	"	64.1
50.41	1			"	"	72.6
47.81	4			"	10.2	35104.5
46.63	2n			"	"	19.1
46.07	2			"	"	26.0
45.26	2			"	"	36.0
* 44.60	3			"	"	44.1
44.28	1			"	"	48.1
41.46	< 1			"	"	83.0
* 41.10	1			"	"	87.4
40.22	< 1			"	"	98.3
39.75	2			"	"	35204.2
38.99	2			"	"	13.6
38.55	1			"	"	19.0
37.03	< 1			"	"	37.9
36.32	< 1			"	"	46.7
35.16	< 1			"	"	61.2
33.32	2			"	"	84.1
33.08	1			"	"	87.1
32.59	< 1			"	"	93.2
32.19	< 1			"	"	98.2
29.35	1			"	"	35323.6
28.84	1			"	"	40.0
28.37	1			"	"	45.8
28.01	1			"	"	50.4
27.62	4			"	"	55.2
27.06	2n			"	"	62.2
26.18	4			"	"	73.2
24.25	1			0.80	"	97.4
22.67	2			"	10.3	35417.1
22.36	1			"	"	21.0
20.22	1			"	"	47.9
19.87	2			"	"	52.3
17.51	3			"	"	82.0
16.10	5			"	"	99.8
14.62	6			"	"	35518.5
* 11.81	3			"	"	54.0
10.67	2			"	"	68.4
10.00	< 1			"	"	76.9
09.68	1			"	"	80.9
09.23	3			"	"	86.6
08.77	1			"	"	92.5
07.39	4			"	"	35610.0
06.83	< 1			"	"	17.1
05.24	1			"	"	37.3
04.82	1			"	"	42.6
03.15	2			"	"	63.8

\* Cf. Krypton II. 2844.59 (3), 2841.10 (1), 2811.81 (2).

SECOND XENON SPECTRUM—*continued*.

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
2800.37	5			0.80	10.3	35699.3
2798.01	2			"	10.4	35729.4
97.74	1			"	"	32.7
97.29	3			"	"	38.5
96.73	2			"	"	45.6
95.00	5			"	"	67.8
89.64	1			"	"	35836.5
85.95	1			"	"	84.0
85.53	1			"	"	89.4
85.10	1			"	"	95.0
83.49	4			0.79	"	35915.7
82.86	2			"	"	23.8
82.45	1			"	"	29.1
80.86	1			"	"	49.7
80.02	1			"	"	60.5
79.78	2			"	"	63.7
78.11	3			"	"	85.3
77.10	4			"	"	98.4
74.99	3			"	10.5	36025.6
74.02	1			"	"	38.3
73.68	2			"	"	42.7
72.54	4			"	"	57.5
70.56	1			"	"	83.3
69.35	2			"	"	99.0
67.96	1			"	"	36117.2
67.71	1			"	"	20.4
66.33	2			"	"	38.5
66.10	1			"	"	41.5
63.71	< 1			"	"	72.7
63.18	1			"	"	79.7
62.90	2			"	"	83.3
61.73	4			"	"	98.7
60.88	3			"	"	36209.8
59.87	< 1			"	"	23.1
59.36	3			"	"	29.8
58.55	1			"	"	40.4
58.02	3n			"	"	47.4
57.76	1n			"	"	50.8
* 56.64	1			"	"	52.4
55.08	3			"	"	86.1
54.80	2			"	"	89.8
54.05	< 1			"	"	99.7
51.09	1			"	10.6	36338.6
48.96	< 1n			"	"	66.8
48.02	3			"	"	79.3
44.26	1			"	"	36429.1
43.71	< 1			"	"	36.4
43.24	1n			"	"	42.6
40.93	3			0.78	"	73.3
39.91	1			"	"	87.0
39.40	1			"	"	93.7
37.18	2			"	"	36523.4
34.31	5n			"	"	61.7

\* Cf. Krypton II. 2756.66 (1).

## SECOND XENON SPECTRUM—continued.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
2734.11	1			0.78	10.6	36564.4
* 33.36	4n			"	"	74.4
32.48	1			"	"	86.2
31.61	1			"	"	97.8
28.37	2			"	"	36641.3
27.38	3			"	"	54.6
25.45	2			"	10.7	80.6
24.71	< 1			"	"	90.5
* 23.56	< 1			"	"	36706.1
23.09	1			"	"	12.3
20.41	1			"	"	48.5
18.92	< 1			"	"	68.6
17.47	7			"	"	88.2
15.91	1			"	"	36809.4
15.07	4			"	"	20.7
14.20	< 1			"	"	32.6
13.50	1			"	"	42.1
12.06	1			"	"	61.6
11.69	2n			"	"	66.7
11.16	1			"	"	73.9
08.65	3			"	"	36908.1
07.49	2n			"	"	23.9
07.15	1			"	"	28.7
06.89	2			"	"	32.1
04.61	1			"	"	63.2
03.58	4			"	"	77.3
02.48	3			"	10.8	92.2
01.99	1			"	"	99.0
01.71	1			"	"	37002.8
2699.29	1n			"	"	36.0
27.70	1			0.77	"	57.8
* 96.72	4			"	"	71.3
96.08	1			"	"	80.0
95.52	1			"	"	87.8
95.28	1			"	"	91.1
94.27	2			"	"	37105.0
* 91.92	1			"	"	37.4
91.63	1			"	"	41.4
91.44	1			"	"	44.0
* 90.33	1			"	"	59.4
89.82	1n			"	"	66.4
87.12	3			"	"	37203.8
85.73	1			"	"	23.0
85.49	< 1			"	"	26.4
82.84	1n			"	"	63.1
80.12	1			"	"	37301.0
79.57	< 1			"	"	08.6
78.70	2			"	10.9	20.6
* 77.29	8			"	"	40.3
76.22	< 1			"	"	55.2
75.51	< 1			"	"	65.1
73.95	2n			"	"	87.0
72.35	3			"	"	37409.3

\* Cf. Krypton II. 2733.38 (4), 2323.46 (1), 2696.71 (4), 2691.94 (1), 2690.35 (1), 2677.30 (2).



SECOND XENON SPECTRUM—*continued.*

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
*2670·80	2			0·77	10·9	37431·1
70·40	1			"	"	36·7
69·12	4			"	"	54·6
68·14	3			"	"	68·4
65·30	1			"	"	37508·3
64·97	1			"	"	13·0
64·61	< 1n			"	"	18·0
63·43	2			"	"	34·7
62·60	< 1n			"	"	46·4
61·99	< 1			"	"	55·0
61·14	2			"	"	67·0
59·51	1			"	"	90·0
58·37	2			"	"	37616·1
55·57	1			"	"	45·8
53·47	< 1			0·76	11·0	75·5
52·93	1			"	"	83·2
52·28	2n			"	"	92·4
51·69	1			"	"	37700·8
50·34	1			"	"	20·0
49·76	1			"	"	28·3
* 48·79	1			"	"	42·1
43·89	1n			"	"	37812·1
43·56	1			"	"	16·8
42·68	1			"	"	29·4
41·25	3			"	"	49·9
39·30	2			"	"	77·8
37·63	3			"	"	87·5
36·95	2			"	"	37911·6
36·58	2			"	"	16·9
35·78	1			"	"	28·4
35·20	< 1			"	"	36·8
34·33	3			"	"	49·3
34·05	1			"	"	53·3
33·53	1			"	"	60·8
30·56	2			"	11·1	38003·6
29·70	3n			"	"	16·0
27·10	1			"	"	24·7
26·12	1			"	"	38·9
* 24·65	1			"	"	89·2
23·31	1n			"	"	38108·7
21·88	1			"	"	29·5
21·52	1			"	"	34·7
20·07	< 1			"	"	55·8
19·83	1			"	"	59·3
17·06	1			"	"	99·7
† 16·79	1			"	"	38203·7
15·83	1			"	"	17·7
15·54	1			"	"	21·9
14·13	3			"	"	42·5
12·61	1n			"	"	64·8
11·17	1			"	"	85·9
10·73	1			"	"	92·4

\* Cf. Krypton II. 2670·78 (1), 2648·80 (1), 2624·63 (1).

† Cf. Krypton II. 2616·80 (2).

SECOND XENON SPECTRUM—*continued*.

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
2609.04	3			0.75	11.2	38317.2
07.68	1			"	"	37.1
07.09	2			"	"	45.8
05.69	10			"	"	66.4
00.29	3			"	"	38446.1
2599.77	< 1			"	"	53.7
98.59	3n			"	"	71.2
97.14	4n			"	"	92.7
95.19	1			"	"	38521.6
94.81	1			"	"	27.3
93.70	< 1			"	"	43.5
91.84	2			"	"	71.4
91.26	1			"	"	80.1
90.59	3			"	"	90.1
88.52	1			"	11.3	38620.8
87.72	1			"	"	32.8
85.45	1			"	"	66.7
84.04	1			"	"	87.8
83.90	1			"	"	89.9
82.74	1			"	"	97.3
* 81.84	1n			"	"	38720.8
78.80	2			"	"	66.4
78.51	3			"	"	70.8
77.11	3			"	"	91.9
74.18	1n			"	"	38836.0
73.06	1			"	"	52.9
* 72.46	2			"	"	62.0
70.41	1			"	"	93.0
69.53	1			"	"	38906.3
68.94	2			"	"	15.3
67.62	< 1			"	11.4	35.2
67.25	1			"	"	40.8
65.09	< 1			"	"	73.6
64.12	1			0.74	"	88.3
61.04	2			"	"	39035.2
60.11	1			"	"	49.4
57.91	1			"	"	83.0
56.30	1			"	"	39107.6
51.85	2			"	"	75.8
50.70	1			"	"	93.5
49.92	3			"	"	39205.5
49.05	1			"	11.5	18.8
46.89	< 1			"	"	52.1
46.57	1n			"	"	57.0
44.27	1			"	"	92.5
42.03	1			"	"	39327.1
41.22	< 1			"	"	39.7
39.08	1			"	"	72.8
38.16	1			"	"	87.1
37.04	2			"	"	39404.5
36.08	2			"	"	19.4
33.47	2			"	"	60.1
31.45	1n			"	"	91.5

\* Cf. Krypton II. 2581.84 (1), 2572.44 (1).

SECOND XENON SPECTRUM—*continued.*

Wave-length	Intensity and Character	Living and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
2530.33	1			0.74	11.6	39509.0
27.10	4			"	"	59.4
26.97	4			"	"	61.5
24.58	2			"	"	98.9
24.13	2			"	"	39606.0
21.58	1			"	"	46.1
20.28	1			"	"	66.5
19.17	3n			"	"	84.0
17.21	1n			0.73	"	39714.9
15.26	1			"	"	45.7
14.85	< 1			"	"	52.2
14.70	< 1			"	"	54.6
14.16	1n			"	"	63.1
* 13.52	1n			"	"	73.2
11.43	1n			"	11.7	39806.2
10.65	2			"	"	18.6
09.89	< 1			"	"	30.7
05.05	1			"	"	39907.7
01.16	2			"	"	69.8
2498.20	1			"	"	40017.1
95.27	1			"	"	64.1
* 94.11	3			"	11.8	82.8
93.60	< 1			"	"	90.9
93.18	1			"	"	97.6
92.69	< 1			"	"	40105.5
91.93	2n			"	"	17.7
90.89	4n			"	"	34.5
90.23	4n			"	"	45.1
86.86	1			"	"	99.6
86.46	4			"	"	40206.0
85.13	1			"	"	27.5
83.59	1			"	"	52.5
79.98	1			"	"	40301.1
79.25	1			"	"	13.0
76.02	10			"	11.9	75.5
72.50	1			"	"	40433.0
71.42	2			"	"	50.6
70.30	2			"	"	69.0
69.57	2			"	"	81.0
† 68.54	2n			0.72	"	97.9
63.72	1			"	"	40577.1
63.14	1			"	"	86.7
55.19	1			"	12.0	40718.0
54.40	1n			"	"	31.2
52.76	2			"	"	58.4
51.50	1			"	"	79.3
51.02	1			"	"	87.3
49.16	1			"	"	40818.3
48.63	1			"	"	27.2
47.79	1			"	"	41.2
47.21	1			"	"	60.9
46.23	1			"	"	67.2

\* Cf. Krypton II. 2513.50 (1), 2494.10 (2).

† Cf. Krypton II. 2468.56 (2).

SECOND XENON SPECTRUM—*continued*.

Wave-length	Intensity and Character	Liveing and Dewar	Runge	Reduction to Vacuum		Oscillation Frequency in Vacuo
				$\lambda +$	$\frac{1}{\lambda} -$	
2436·63	1			0·72	12·1	41028·2
35·59	1n			"	"	45·7
33·75	1			"	"	76·8
32·87	1			"	"	91·6
29·11	1			"	"	41155·2
† 25·18	2n			"	12·2	41222·8
23·08	1			"	"	57·6
22·28	3			"	"	71·2
21·36	1			0·71	"	86·9
18·83	1			"	"	41330·1
18·47	1			"	"	36·2
16·86	1			"	"	63·8
14·88	1			"	"	97·7

† *O.* Krypton II. 2425·16 (1).



## SECOND 'INDEX INDICIS.'

Abbreviations :—Sp., spark-spectrum; Arc, arc-spectrum; Ab., absorption-spectrum; Fl., flame-spectrum; Bd., band-spectrum; L., line-spectrum; Cl., compound-line-spectrum; V., vacuum-tube-spectrum; Ph., phosphorescent-spectrum. The bound volume of the 'Index' is denoted by A, the appendices by B, C, D, &c.

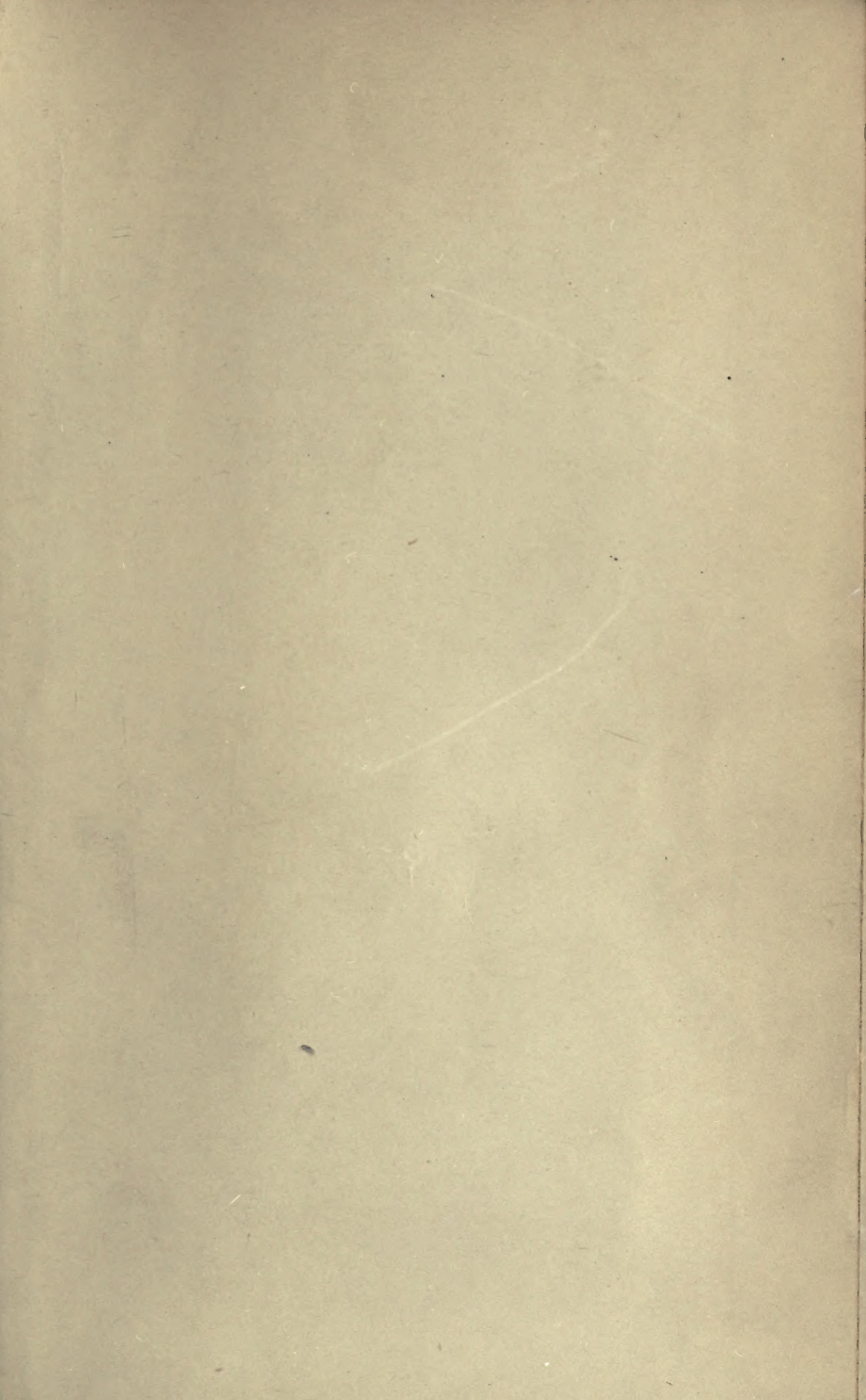
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Bismuth Oxide . . . . .	{ Sp., A, p. 165.	Chromium Chloride . . . . .	{ Arc, A, p. 39; F, p. 1. Sp., A, p. 171.
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		Copper Iodide . . . . .	{ Fl., A, p. 172.
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Gallium . . .	{ Sp., A, p. 49; D, p. 1; L, p. 1. Arc, A, p. 49.		
Germanium . . .	Sp., A, p. 211.		
Gold . . .	{ Sp., A, pp. 49, 211; H, p. 56; M, p. 1. Arc, E, p. 14.		
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Manganese Oxide . .	{ A, p. 176; G, p. 65. Sp., A, p. 105; G, pp. 28, 40.		
Mercury . . .	{ Arc, D, p. 17; G, p. 28. Sp., A, p. 107; K, p. 5.		
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Phosphorus . . .	{ L., A, p. 119. Bd., A, p. 119.		
Phosphorus Oxide . .	Fl., G, p. 50.		
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Platinum . . .	{ Sp., A, pp. 120, 232; J, p. 99. Arc, J, p. 99.		
Potassium . . .	{ Fl., A, p. 121; F, p. 9; G, p. 48; O, p. 32. Sp., A, p. 121; G, p. 23. Arc, A, p. 121; D, p. 2; M, p. 74; N, p. 1.		
Potassium Perman- ganate . . .	{ Ab., A, p. 207.		
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